McGill University Libraries
3 100 876 026 T

DEC - 1990

SERIAL

MACDONALD COLLEGE
LIBRARY
McGILL UNIVERSITY

THE MACDONALD JOURNAL

FEBRUARY
1986

MACDONALD COLLEGE LIBRARY
FEB 1986

THE MACDONALD JOURNAL

FEBRUARY 1986

Volume 47, No. 1
February 1986

Editor:

Hazel M. Clarke

Publications Committee:

Co-ordinator: Laurence Baker
Hazel M. Clarke
Professor Bruce R. Downey
Professor E.R. Norris

Regular Contributors:

Emeritus Professor R.H. Estey
Department of Plant Science
for "Fun Fact Fable Fiction"

Dr. A.F. MacKenzie
Associate Dean, Research
for "Seeking Solutions"

Tom Thompson & Kathy Whitehurst
Martlet House
3605 Mountain St.,
Montreal, Que.
H3G 2M1
for news from the Graduates' Office

Cover Design by:

John Starkey, cover photo by Bertrand Farmer

The Macdonald Journal is published quarterly (February, May, August, November) by the Macdonald Extension Service of the Faculty of Agriculture of Macdonald College of McGill University.

Material in this issue may be reprinted editorially without permission; however, credit to the Macdonald Journal would be appreciated. Address all inquiries to the Editor, Box 284, Macdonald Journal, Macdonald College, Quebec, H9X 1C0.

Second class registration number 0463.

Subscription rates are $6.00 for one year. Outside Canada — $10.00 for one year.

Printed by Harpell's Cooperative, Gardenvale, Quebec.

This Issue **Page**

Features

Cover Story

Bertrand Farmer, coauthor with Norm Campbell of our lead article in this special dairy issue, likes to tell people of a DHAS reunion that took place a few years ago where Dr. John Moxley recalled that in the first couple of years all the farmers on DHAS would fit into one room and now that same room is hardly big enough to accommodate the fieldmen. How DHAS has grown and how successfully. We are fortunate that Dr. Moxley and his colleagues in DHAS, in the Department of Animal Science and the Diploma in Agriculture Program find the time to write for our Journal readers. We appreciate it and hope you do as well. We also appreciate the time taken by Rudi, Peter, and Jack Bienz, pictured on our cover, for their contribution to this issue, our sixth consecutive February one on dairy. Happy 20th anniversary DHAS! There just has to be many, many more.

The following organizations or individuals

are

financially sponsoring

The Macdonald Journal

BANK OF MONTREAL

CIBA-GEIGY SEEDS
division of
CIBA-GEIGY CANADA LTD.

INTERNATIONAL STOCK FOOD COMPANY LIMITED

RALSTON PURINA CANADA INC.

Dr. Donald McQueen Shaver
of
SHAVER BEEF BREEDING FARMS

DHAS and the Bienz Family

"... every time our supervisor comes it's an event"

In planning articles for the annual dairy issue it was easy to find a common peg on which to focus — the 20th anniversary this year of the Dairy Herd Analysis Service (DHAS). Naturally we have an article discussing the growth of this dairy service over the 20 years and also looking down the road to the future, but what better way to depict the success story of DHAS than to show how the service has helped a dairy farmer to improve his herd and to steadily increase production. It did not take our planners long to reach the conclusion that the farm to visit was in Lacolle, Quebec.

Rudolph Bienz was not one of the original farmers who joined DHAS in 1966, but since joining he and his sons Peter and Jack have taken the services offered by DHAS seriously, and it shows in the results they have achieved over the years. Thus one day in early November last year Norman Campbell, Manager of DHAS, and Bertrand Farmer, at present Director of Farm Practice for the Diploma Program and a former field supervisor for DHAS met with the Bienz family and talked dairy.

It could also be called a Dip reunion for Norm and Bertrand are both Dip graduates, '66 and '75 respectively, and both Peter and Jack went through the Program — Peter in '74 and his brother two years later in '76. In a way, therefore, this is not only a DHAS-farm family success story, it is also — along with the guiding hand of Rudi Bienz — a Dip success story as well.

Norman Campbell: When you left Switzerland, Rudi, did you come straight to this farm?

Rudi Bienz: No, prior to buying this farm I was herdsman for six years — five years on my neighbour's farm and one year near Bedford. During this time I was able to learn quite a lot about farming in Canada which was very different from back home.

We started out here on May 1, 1960. The Holstein herd and machinery were on the farm. There were about 38 cows and 30 head of young stock. We had a cold loafing barn and two wooden silos with no roofs, no loaders — it was hand unloading. We were one of the first ones to have a silo unloader because as we were feeding in the cold loafing barn after two or three days we would have frozen silage everywhere.

Slowly we have tried to improve. We now have a herd of 90 milking. We were able to buy more land and now have some 150 hectares.

Norman Campbell: You've done exceptionally well with your grade herd.

Jack Bienz: We have mostly NIPS (National Identification Program) and some purebreds. In 1974 about the same time as we started official test with DHAS we registered all the cows on the NIP program in hopes of eventually getting a purebred herd but things didn't go quite that fast.

Bertrand Farmer: How many qualified "D" cows do you have right now?

Jack Bienz: We have two or three right now.

Peter Bienz: We have a lot of "Ds" and "Es" but we would have to pay about $250 each to have them qualified.

Norman Campbell: I know an awful lot of registered herds on DHAS that would like to have the 8,000 kilo herd average that you have with a grade herd.

Jack Bienz: That's right. We have got a few up to "D", but you have to have the classification and the milk production. Milk production is getting easier for us now. We've got several in this category, but they just didn't make the classification and others aren't "Ds" yet. We must also remember that a cow might have one or two bull calves, and we're not going to put out that money to qualify a dam until we have a heifer out of her. It's a slow route to go.

Some people suggest that we start buying purebred cattle, but I don't see any advantage in getting rid of all the cows that are NIPs now and replacing them with purebreds just to say they're purebred. Our cows may not have the papers, but they've been bred pure for the last 25 years. We keep the best of our heifers, and we have a market for all the others. We have no problem selling bred heifers as there is a lot of demand for them.

Norman Campbell: We made some very fundamental changes in our program in 1979, particularly in the area of feeding. Do you use our program to help with your feeding decisions?

Jack Bienz: We balance our rations with our supervisor. We bring in ideas and we try different things out. When we started total mixed ration we did some experimenting and it didn't do our herd average much good, mainly due to the fact that we only had two groups of cows. Now we balance our rations every month. We have got into the habit of doing more feed sampling as often as we can, and we try to keep our information as realistic as possible so that the figures on the paper that we get every month are close to what we are actually feeding.

Peter Bienz: I find the records are extremely helpful for choosing bulls. The first thing I automatically do before a cow is bred is to pull out her DHAS folder. I look at her milk production, her last year's milk production if she is an older cow, her fat test, her protein. Do I have to improve her milk, her fat? Then I'll start choosing a bull.

Jack Bienz: He also looks at her conformation, her classification test.

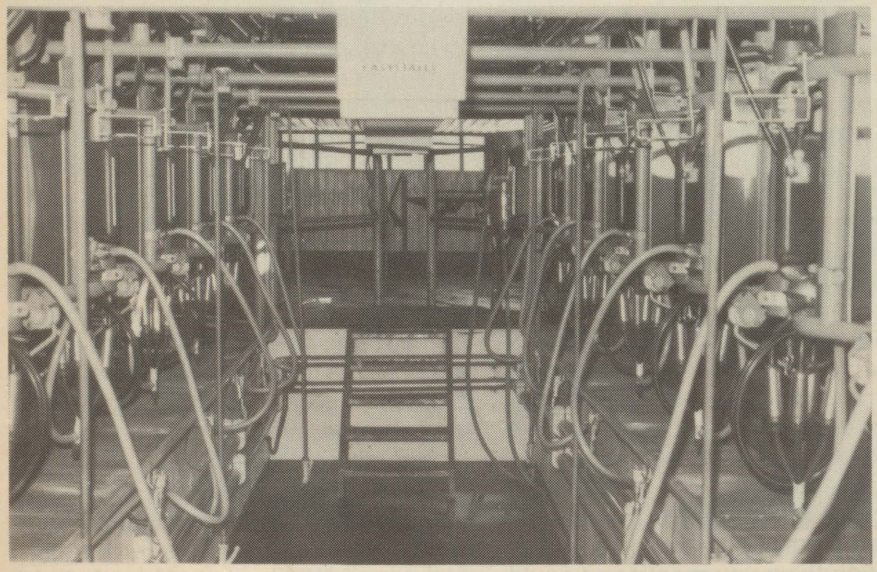
Peter Bienz: I'll see what the Centre recommends for bulls — sometimes it will take me half an hour to pick one bull — and then I end up with a bull calf!

Rudi Bienz: The boys keep a good eye on the cows and I do think we are lucky to have the service of a good AI Centre.

Jack Bienz: We thought about doing our own breeding but feel we have enough to do as it is and besides the people doing it are specialists.

Peter Bienz: For the last two years we have the veterinarian come in at two-week intervals just for reproduction.

An automatic barn cleaner and a new milking parlor are two of the improvements that have been made over the years.



Jack Bienz: We've got a breeding wheel for the cows and one for the heifers. I don't know whether we are fanatics for heat detection but that is one thing that we work hard on. Every day when we enter the barn we know which cow should be in heat that day, which cow might be repeating at three weeks, which cow might be repeating at six weeks. Those cows are marked with a mark stick — we chalk the tail head of every cow that is supposed to be in heat and every cow that is three and six weeks bred, and we keep observing them. Any heats we see from the day a cow calves are on the calendar. If she's in heat and we have to wait three weeks to breed her, her pin is turned. If we haven't seen any heat signs, a cow is checked to see that she is cycling normally.

Bertrand Farmer: You are not looking at the whole herd and wondering which one should be in heat.

Peter Bienz: We are not in there blind. We look at the wheel — she's at three weeks, she's at six weeks. This cow should be coming into heat today. You can single that cow out: is she sleeping, is she at the bunk? We keep a blackboard as well as the breeding wheel. On weekends, for instance, one of us can tell the other guy to watch that cow and perhaps describe some of the symptoms of a particular cow as she might be coming into heat.

Rudi Bienz: A blackboard should be in every barn, and not only for what is going on in the barn.

Norman Campbell: I agree, particularly for every barn that has more than one person working in it.

Jack Bienz: We also have one in the shop. We keep a schedule for the machinery and if things break down, we write down the parts needed. If we put a machine away in the winter that is not 100 per cent perfect, we write down what's wrong.

Peter Bienz: It's part of record keeping and that is what DHAS is all about.

Norman Campbell: Another service that is available as an option is the cell count service.

Jack Bienz: We've been on that for about six years. That's good. In the beginning we didn't really understand how it was supposed to be used. The report used to come and I would read "this cow has a high cell count," and I'd think that doesn't do me any good; I've treated her for mastitis. As I knew she had trouble I would wonder what the point was of having that on the paper.

With time you learn to look at it over the year and not over the month. We never used to cull cows with problems such as high cell counts. We have got into the habit of doing that now and that's made a big difference. If anything, it has improved our herd average. Knowing which cows to cull is so important. You may want to cull a cow because you don't think she is giving that much milk or you don't think she is really going to do well. You look at the records and they can surprise you both ways. You have a cow you are hanging onto and she is costing you. Get rid of her. You have to be more severe. It's the same thing with the cell count. We held onto a cow because she was good but we held onto her too long, even though she was giving us a lot of trouble. It is hard to measure how much trouble she was causing in the herd, infecting other cows.

Over the last two or three years we've improved herd health and udder health alone has really brought us a long way. Last year our goal was to get our cell count down under 100,000, which we did for two months and over 1985 we hovered between 100,000 and 150,000. We will keep working on it because udder health is something you have to keep on top of. When we switched to total mixed rations and the new parlor our cell count came down.

When we see our production go up a bit, it gives us that much more incentive to try a little harder and take a little more time. Over the last two or three years every time our supervisor comes it's an event. We want to see how much better that cow is going to do. It's changed things for us.

Norman Campbell: Our philosophy is

to try and give the maximum information that can be practically given to assist the farmer at a reasonable cost, and we keep looking at ways to improve. A suggestion has been made that we could perhaps analyze for cell count every other month instead of every month. Would you feel it would be as informative?

Rudi Bienz: It could be done. I find the boys are doing a real good job with the milking. There is only one cow in the whole herd with just three teats. I remember years ago when there would be half a dozen or more three teaters.

Peter Bienz: The cell count program has helped us. We've changed a lot in our milking routine, too. The parlor has changed things. We used to have four people milking, often different people all the time, and that makes a big difference.

Jack Bienz: Even after we had the new equipment, we had mastitis problems. You can't let up for a minute. It's so fast, especially in a big herd, that you can go from real good to real bad in a hurry.

Norman Campbell: What are your thoughts on direct access into our data file from an on-farm computer? It's a natural evolution and will probably happen within two or three years. The speed of getting the data back would be an advantage, don't you think?

Jack Bienz: The mail can be a problem. We're about 10 days now from test date to getting results backs, depending on where weekends fall. There's a lot of information that we can still use, but there is a lot that is already outdated. Sometimes we are already into another feed change. Every month I check how the index has come out to see if we are pretty well on line. Sometimes we're half way in between. Sometimes I need some help with my ration, and I have to wait.

Norman Campbell: Our developent group is looking at the possible use of a portable microcomputer which could include feeding programs and heifer management packages as well. The supervisor would be able to give you a printout of feed recommendations on test day. You would get your production records, lactation certificates, etc., in the mail.

Jack Bienz: Heifer feeding programs would be good. They're being put into groups, too. I would like to be able to follow them a little closer to see if an animal is getting too fat, over or underconditioned.

Bertrand Farmer: With grouping you could formulate specific rations for specific animals.

Peter Bienz: The way we are set up there would be a problem with conveyors. We could go into it but we would need another silo and another mixer.

Jack Bienz: Sometimes it's hard to integrate things into an old system. With a new installation it's easy. Each year we do some changes. I'd like to get the heifers on DHAS early and have some kind of indexing to follow them through. We would then know which animals to keep.

Bertrand Farmer: It is actually recommended that you raise all heifers and select at about one year of age.

Jack Bienz: We could do some selection before we got them in the parlor.

Bertrand Farmer: You could have records for weight, height, first heat, etc.

Norman Campbell: Is there anywhere else where we could be helping you more?

Jack Bienz: I would like to know more about the right time to move cows. It's kind of a game we play now. There's a few factors involved, and it's hard to measure a cow. When do I move her? There's her production, her first time in lactation, days bred, days open, her condition and her weight. What lactation is she in, and so on.

Norman Campbell: I would say that most everything you mentioned could probably be included in the program, except condition.

Jack Bienz: You have to use your judgement there. We've noticed that heifers can take a lot more change than an older cow.

Bertrand Farmer: We've talked about cell count and nutrition, etc., knowing that you have an 8,000 kilo average, what is your calving interval?

Rudi Bienz: It is around 365 days. It has never been higher than 375 days — this is something we work very hard at.

Norman Campbell: Is the financial information on the DHAS report something that you look at or is it secondary for you? I'm talking here both on a per day basis on gross returns over feed costs and then on a cumulative basis.

Jack Bienz: Our big goal over the last five years has been to try to bring down the cost per 100 litres of milk. We've been able to compare with the province, and it is nice to see where we're at and the amount of milk we've been able to make with our crops. It's not a figure we work with daily.

We still have work to do with fat test over the next few years.

Bertrand Farmer: What is your BCA?

Peter Bienz: Our projected BCA is 176 for milk and 167 for fat.

Bertrand Farmer: You are about 10 points below for fat. Fat must be around 3.5, 3.4 now.

Jack Bienz: When you get into higher production and try to produce the highest energy and highest protein feed that you can, you are in a constant battle with fibre. When I say fibre, it's health I'm worried about.

Norman Campbell: Now that your dad is "just" the boss, do you fellows divide responsibilities or are you both active in all aspects of the dairy herd management?

Jack Bienz: Since we've got the parlor, I milk mornings and Pete in the afternoons and that has worked well. We're doing most of the milking. Sometimes someone else will help with washing udders. We both keep busy with the rest of the work. I take care of the ration balancing. Dad does just about all the feeding now, and Pete has been taking care of all the breeding and records. We may share jobs like ploughing so that neither one of us gets fed up with it. Pete plants most of the corn, and I look after the small seeds, the alfalfa, and the fertilization of the land. We don't grow much grain but Dad looks after that.

With all of us working our herd average has gone up, we have made changes in feeding, and we've improved our crop which has helped, too.

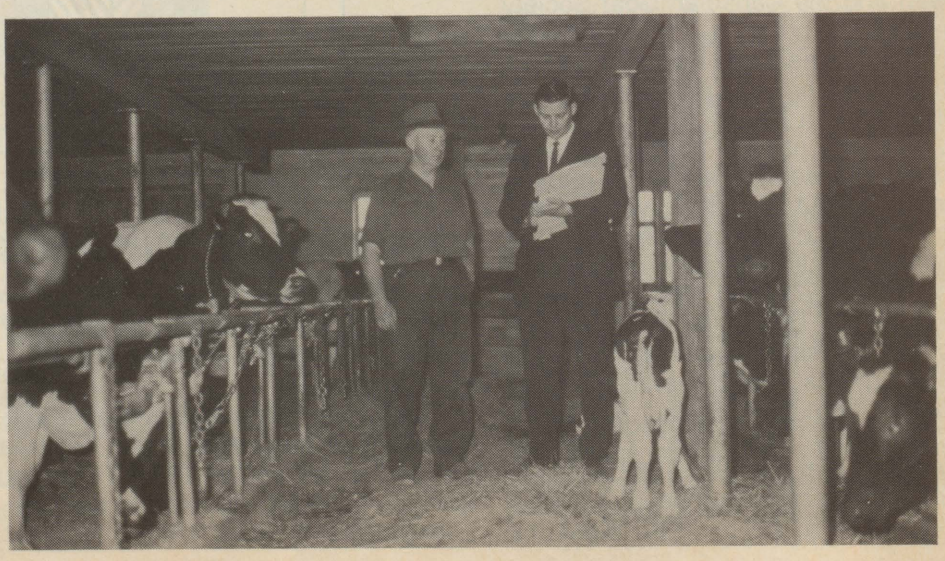
Bertrand Farmer: *To summarize this interesting discussion, one should realize that there is nothing miraculous happening at the Bienz farm. The answer is management. They have been and are progressive and open to new ideas, and, more important, they are very knowledgeable about dairy production. Discipline and communication are also key words at the Bienz farm.*

In conclusion in the last 20 years they have improved nutrition, breeding, health, and housing but mainly they have **managed** *their dairy enterprise.*

DHAS is no miracle; it has been and is a tool that they take advantage of!

Twenty Years of Growth and Improvement

FLASHBACK TO February 1966, above, when the Dairy Herd Analysis Service was introduced to the public at the Salon de l'Agriculture at the Showmart in Montreal. In the background, Herb MacRae, who developed the DHAS lab, is at the first IRMA in a herd testing laboratory, Marcel Couture, one of the first fieldmen, and, in the foreground, Peter Hamilton, who was in charge of field promotion, and Bob Baker of the Department of Animal Science. Below: In May of 1966 there were 17 herds on DHAS; the fourth herd to join being that of the late Ranald McDonald seen here with Norman Campbell.



by Robert Moore
Assistant Research Director, DHAS
and Susan Joyal, MSc,
Research Assistant, DHAS

February 1966 saw the introduction of the Dairy Herd Analysis Service (DHAS) to the public at the Salon de l'Agriculture in Montreal. At that time, a need had been identified to promote a new direction for milk recording in Quebec and Canada. The goal of this new service was to provide the dairyman with the essential information with which he could make management decisions. Also, as the planning and development of the future of the dairy industry is aided by comprehensive records of past performance, the records were to serve as a base for research and development.

How the program has grown since the first 17 herds were tested in Quebec in May 1966! Statistics to the end

of 1984 indicate that the program has grown to service 8,495 dairy cow herds in six provinces and 117 goat herds for the Canadian Goat Society. Figure 1 indicates the change in the number of herds enrolled on different milk recording programs in Canada. The federal R.O.P., the provincial D.H.I.A., and the postal testing programs had long been established prior to the introduction of DHAS. Yet, at the end of 1984, 44 per cent of the herds on milk recording in Canada were being processed by DHAS. During the 1970s, enrollment on DHAS accounted for almost 100 per cent of the net growth of milk recording in Canada.

Forty per cent of Canada's dairy cows are located in Quebec. Thus, it is not surprising to find that the majority of the herds on DHAS are found here. The number of herds on test (official and owner sampler) in Quebec for five-year intervals from 1969 to 1984 are shown in Figure 2. By 1984, 42 per cent of Quebec dairy herds were enrolled on DHAS. The most rapid growth of the program occurred between 1974 and 1979. This period marked the development of the official program that was initiated in 1973 at the request of the Quebec Ministry of Agriculture to provide a greater volume of lactation records to prove young sires in the artificial insemination (AI) unit. The Quebec service has been offered as a joint program of Macdonald College and the Quebec Ministry of Agriculture since April 1970.

Between 1966 and 1969, DHAS was introduced in the provinces of Nova Scotia, New Brunswick, Prince Edward Island and Newfoundland. Saskatchewan and the Canadian Goat Society entered the program in 1980. The number of cow herds on test for the Atlantic provinces and Saskatchewan is illustrated in Figure 3.

Not only has the number of herds using the service shown a marked increase but also the average milk production of the cows on test. The milk production per cow by province for 1974, 1979, and 1984 is shown in Figure 4. This data combine the production of all owner sampler and official herds. The 10-year milk change ranges from 1,174 kg to 1,501 kg for these four provinces. Philipsson reported that the 1973-1983 increase for eight western European countries ranged from 585 to 1,098 kilograms

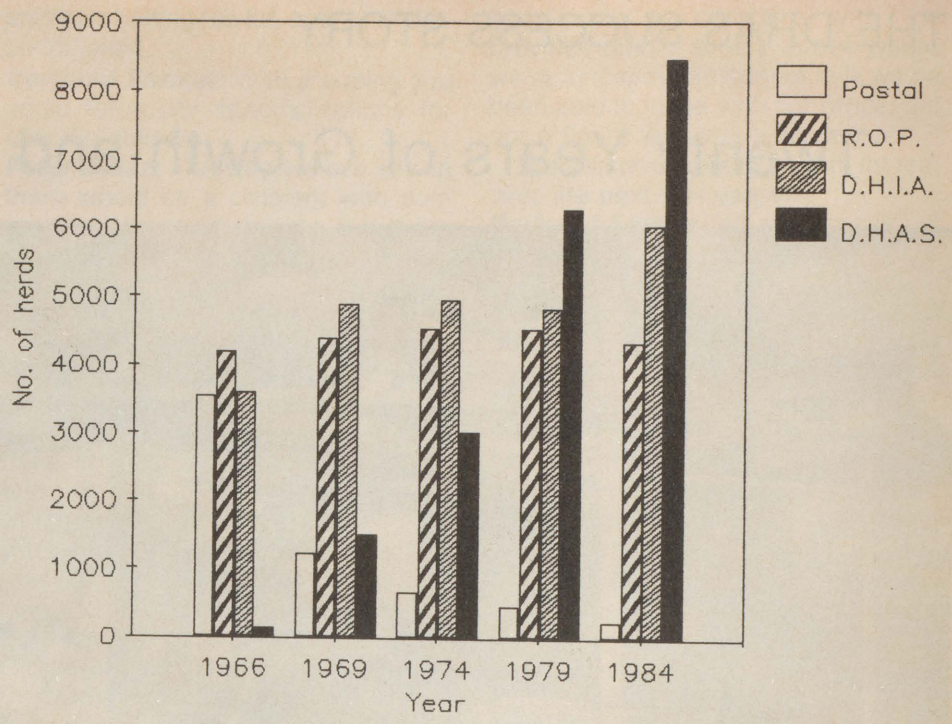


Figure 1. Growth of milk recording programs in Canada, 1966-1984.

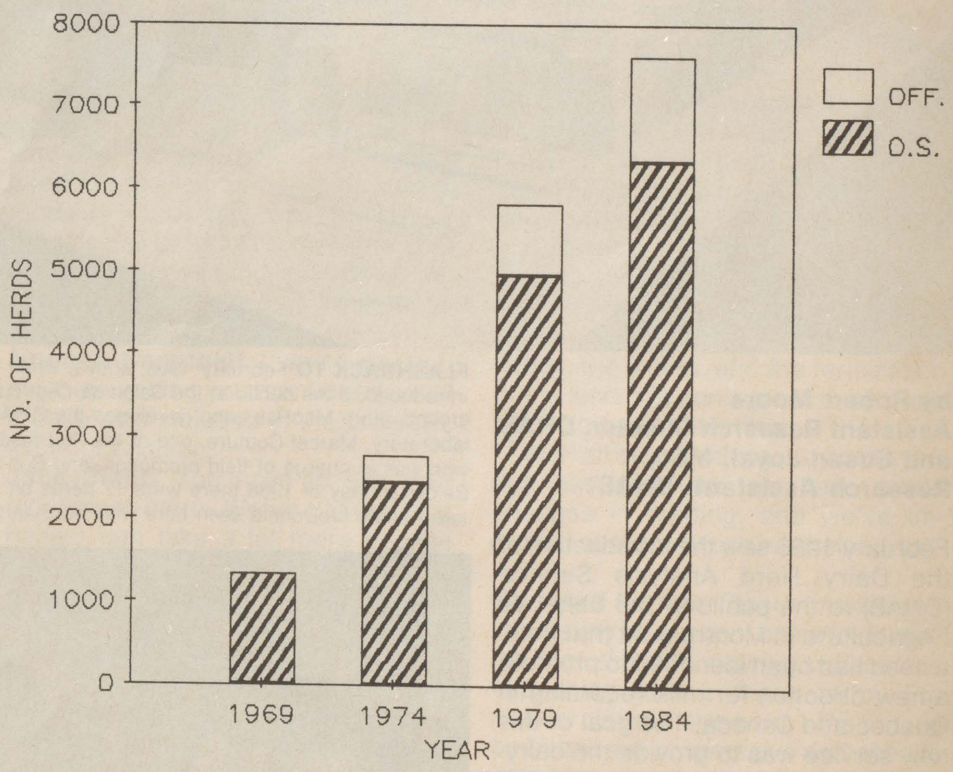


Figure 2. Herds on DHAS — Quebec, December 31, 1969 — December 31, 1984.

(Benchmark 100, Hostein Canada 1984). The DHAS increases for all four provinces exceeded the 10-year European increases.

Three milk recording programs in Canada had more than 1,000 herds enrolled at the end of 1984. Table 1 compares the growth and production changes over the past 10 years for the R.O.P., Ontario, and Quebec programs. The 10-year increase in milk production in Quebec of 1,695 kgs for official and 1,305 kgs for the regular (owner sampler) herds represents a 56 per cent and 30 per cent greater increase in milk yield than the corresponding Ontario programs. Part of the increase may be attributed to the

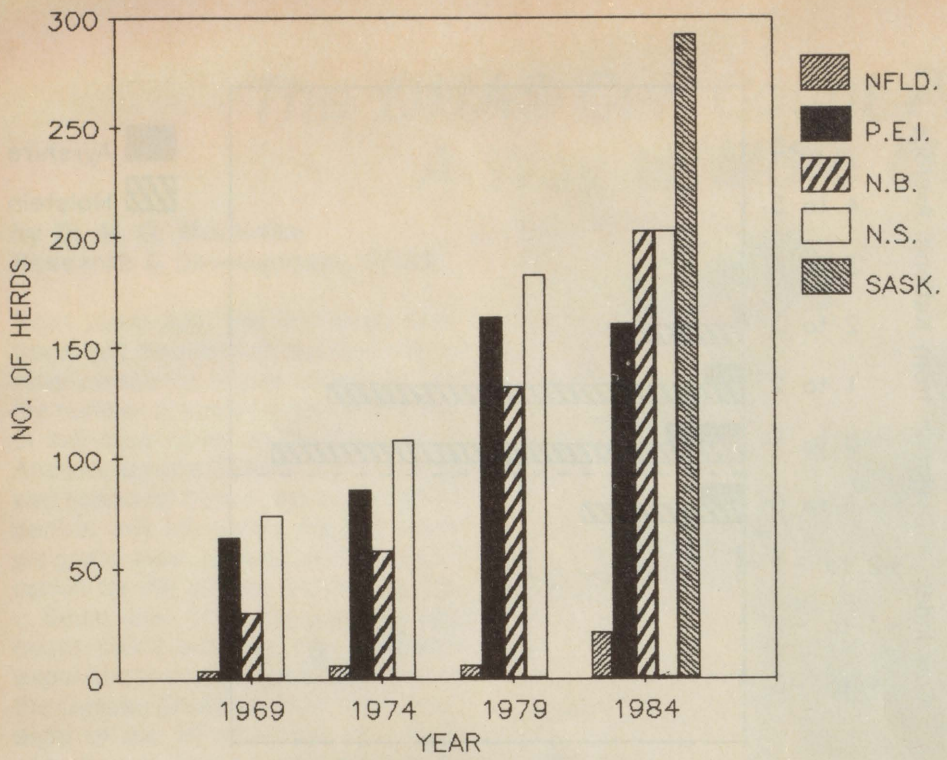


Figure 3. Herds on DHAS by province, December 31, 1969 — December 31, 1984.

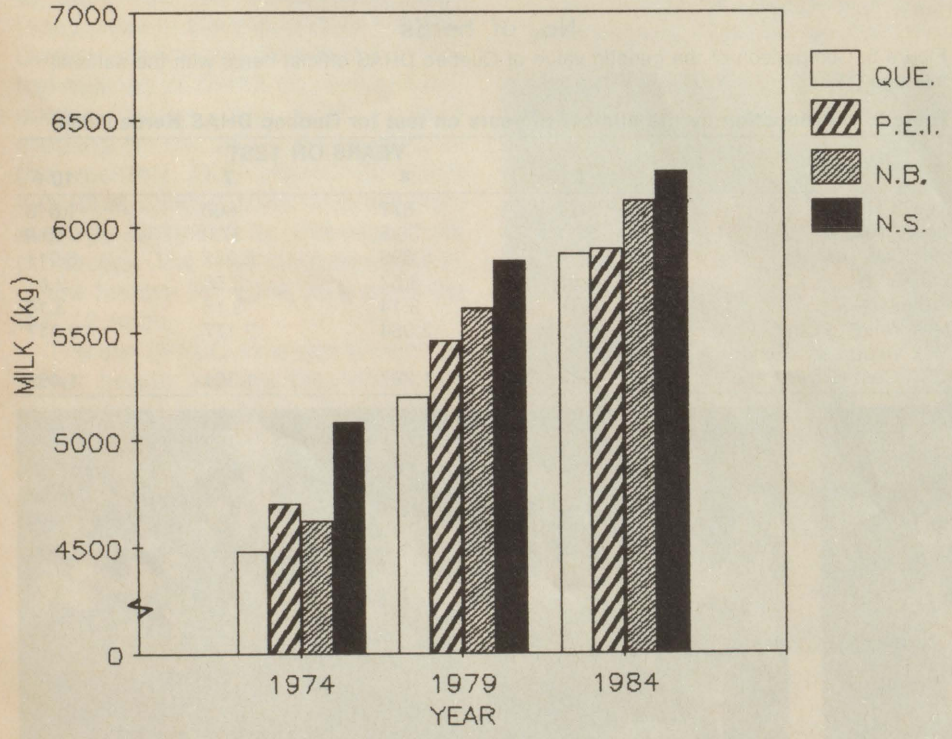


Figure 4. Milk yield/cow/year in DHAS herds by province, Official and Owner Sampler, 1974 - 1984.

Table 1. Comparison of increases in milk recording and production in Quebec, Ontario, and ROP programs 1974 to 1984

Program	1984 Statistics Herds No	1984 Statistics Production/Cow Milk (kgs)	Change 1974-1984 Herds No	Change 1974-1984 Production/Cow Milk (kgs)
		OFFICIAL		
R.O.P. — Canada	4,344	6,588	− 197	+1,113
Ontario DHIC	2,448	6,263	+ 946	+1,083
Quebec DHAS	1,275	6,627	+ 943	+1,695
		REGULAR		
Ontario DHIC	1,649	5,572	+ 68	+ 997
Quebec DHAS	6,340	5,747	+3,888	+1,304

DHAS herds starting from a lower level of production. Nonetheless, in a relatively short time DHAS herds have caught up and exceeded the average performance of herds on the other programs.

On average, the herds on Quebec DHAS have been on test for approximately seven years. The production characteristics of this seven year group of herds were very similar to the 1984 average for all herds on DHAS. Table 2 shows the production by the number of years on test for Quebec DHAS herds. Studies have shown that the greatest gain in production is achieved in the first year on milk recording. The data in the table indicate that the average production is increasingly higher for those groups that have been on milk recording longer. The trends has been to continue to improve after the first year of testing.

There were only two DHAS herds producing 7,000 kgs of milk per cow in 1974. In 1979 the number had grown to 86. By 1984, there were 763 herds with a herd average greater than 7,000 kgs. To what can we attribute the increase in production?

DHAS provides official records to Agriculture Canada to produce sire proofs and cow indexes. An estimate of the phenotypic and genetic change that is occurring in the herd for each year on official test is provided to the dairyman along with his cow indexes by Agriculture Canada. An analysis of the Quebec official records from the January 1985 cow index run, that included records to the end of August 1984, was undertaken. This study allowed for the comparison of the average cow index of each Quebec official DHAS herd for milk production with the national average. The results in Figure 5 illustrate that 70 per cent of the Ayrshire herds and 86 per cent of the Holstein herds were above the national average for their breed.

The average herd has been improving by 3.6 BCA points per year for the 148 Ayrshire herds included and 3.54 BCA points per year for the 936 Holstein herds. This represents the phenotypic change; the combination of environmental effects (nutrition, health, management, etc.) and genetic gain. As the cow indexes estimate the genetic value that a cow will transmit to an offspring, the average genetic improvement in the herds can be

obtained by doubling the average changes in cow indexes that are reported. The results showed that the average genetic change per year was 1.02 BCA points in Ayrshires and 0.76 BCA points for Holsteins.

The above figures indicate that 20 to 30 per cent of the change in milk yield in these herds was due to genetic improvement. Thus, 70 to 80 per cent of the improvement can be attributed to management factors. Consequently, the importance of a milk recording service that includes nutrition, reproduction, health, and management information cannot be ignored.

The goal of providing the dairyman with the essential information to make sound management decisions remains. The growth of the program and the increased production in the herds using the service are testimony to the success the program has achieved over the last 20 years in meeting this goal. The 1980 National Conference on Milk Recording noted at that time:

> "the Quebec DHAS program is the most comprehensive available in Canada and stands in high regard in the North American context."

The application of new technology and the incorporation of research findings to continue to respond to the needs of the dairyman hold the challenge for and thus the key to the continued success of DHAS.

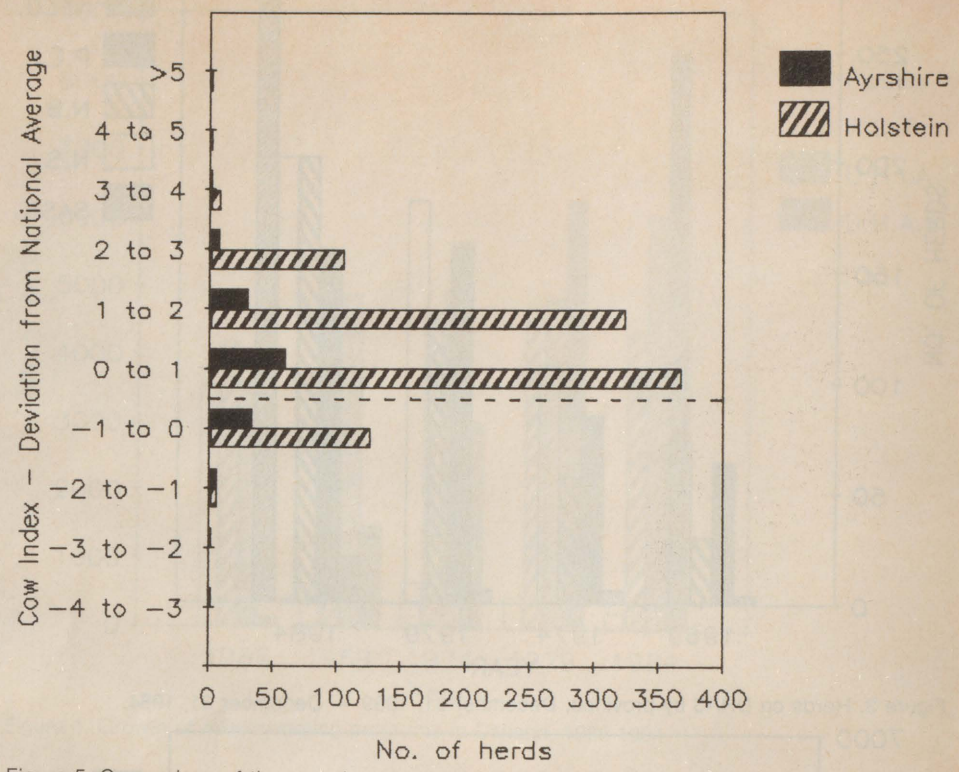


Figure 5. Comparison of the genetic value of Quebec DHAS official herds with the national average (1984).

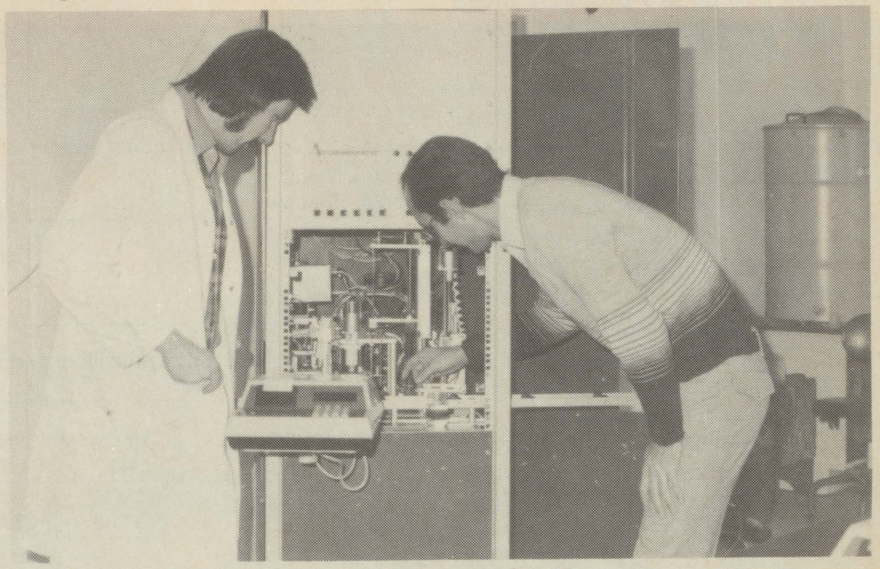
Table 2. Production by the number of years on test for Quebec DHAS Herds (1984)

	YEARS ON TEST			
	1	4	7	10+
No. of Herds	477	677	660	1,816
Cows/Herd (#)	33.7	36.5	37.0	40.9
Milk/Cow (kg)	5,411	5,699	5,952	6,211
Fat %	3.55	3.57	3.58	3.61
Protein %	3.14	3.14	3.15	3.16
Milk Value ($/Cow)	1,967	2,084	2,177	2,317
Milk Value Less Feed Cost ($/Cow)	1,217	1,297	1,361	1,456

FLASHBACK TO 1966 when the total field staff for DHAS numbered five: front, 1 to r, the late Stuart McDonald, Marcel Couture, back l to r, Norman Campbell, Roger Daoust, and, missing from photo, Michel Toupin. At right, in 1973 the staff numbered 37, and today there are some 160 fieldmen.

The DHAS Cell Count Program: A Way to More Milk

by Dr. H. G. Monardes
Research & Development, DHAS

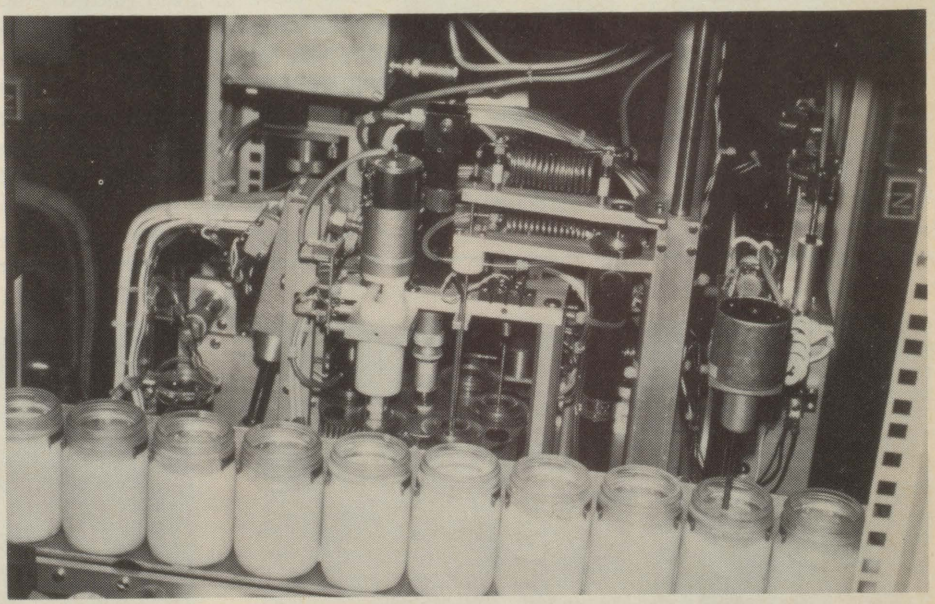


FLASHBACK TO 1975 and the installation of the first Fossomatic somatic cell counter in North America. It is seen here being examined by the then lab technician Martyn Would and lab manager Peter Knox. The lab now has six of these units.

Eight years ago, the first Foss electronic cell counter introduced in North America started to give information on the number of somatic cells in the milk of individual cows on the Dairy Herd Analysis Service (DHAS). The Foss unit was tested for over a year at the DHAS central milk lab before the cell count program was offered as an extra option for the official Quebec herds.

Since that time the somatic cell count (SCC) program has gradually expanded to serve over 50 per cent of the Quebec DHAS herds in 1985. Also, eight of the 10 provinces now have somatic cell count services available to dairymen. Six Fossomatic units today process the milk of over 130,000 Quebec cows every month at the central milk lab of DHAS located at Macdonald College. Over 4,000 farmers enrolled on the SCC service receive the monthly SCC report for their individual milking cows with the herd average weighted by individual milk production. The report includes the cell count history for each cow over the last 12 tests.

The use of SCC as a tool to monitor udder health has contributed to the reduction of mastitis in DHAS herds. The reason is that the SCC is a close estimate of the number of leucocytes in milk. Since the leucocyte function is engulfing and digesting bacteria in a process known as phagocytosis, minimal quantities of leucocytes in milk are desirable in normal healthy udders. However, a concentration of cells in milk of more than 400,000 per millilitre may indicate an abnormal condition in the udder, bacterial infection and injury to mammary tissue. Under the present Quebec dairy industry regulations, a bulk tank having a count over 750,000 cells/ml can be penalized or rejected.



A close-up of the Fossomatic taking a milk sample for analysis.

Cell Counts in DHAS Herds

The average cell count of DHAS herds has declined from over 400,000 in 1977 to less than 300,000 in 1984. For a group of over 200 herds that requested cell count service in February 1977, and have continued on the program, the average was 252,000 cells/ml in 1984.

The average herd SCC for herds in 1984 averaged 288,000 cells/ml of milk. Field studies and research on empirical data suggest these are acceptable levels and desirable goals for the involved farmers.

Cell Counts and Milk Yield

High somatic cell counts are associated with mastitis and low milk production. Low somatic cell counts are associated with a better quality of milk, higher milk yields, and more efficient production. This relationship is indicated in the following table.

Dairy herds with somatic cell counts below 200,000 produced over 1,000 kilograms of milk per cow more than those with counts over 750,000. DHAS annual summaries suggest that this difference would be reflected in a net return over feed cost difference of $275 per cow per year. Certainly not all this is due to somatic cell count

differences, because the herds with the higher cell counts have probably been on the program for a shorter period of time, and the herds with the lower cell counts are probably those with other good management practices. By the same token, herds were grouped by level of production. As shown in Table 2, the top 450 herds using the cell count program had average counts of 237,000 cells/ml of milk.

Another interesting appreciation of the value of somatic cell counts is done by comparing milk production and increase in yield for a five-year period for those on the cell count service for one or more years and those that were not on the somatic cell count service. This is provided in Table 3.

The herds on cell count produced 227 kilograms more milk than those not on cell count in 1984. The difference in the improvement in the five-year period was 105 kilograms of milk per cow. This extra production was worth an extra $24 per cow per year over feed costs in 1984.

Table 1. Milk production by level of somatic cell counts in Quebec DHAS herds in 1984

Cell Count Range (000/ml)	Herds No.	MilkYield Kg/Cow
⩽ 200	1,047	6,170
200 — 299	1,223	6,086
300 — 399	715	5,899
400 — 499	339	5,716
500 — 749	248	5,496
⩾ 750	41	5,138

Table 2. Somatic cell count averages by level of production in Quebec DHAS herds

Milk Yield Range (Kg/cow)	Herds No.	Cell Count ('000/ml)
⩾ 7,000	450	237
6,000 — 6,999	1,342	268
5,000 — 5,999	1,352	300
⩽ 5,000	469	357

Table 3. Comparison of milk yield and milk yield improvement with and without somatic cell count services

Somatic Cell Count Service	Herds No.	Milk Yield 1984 Kg	Improvement Herds No.	1979 to 1984 Milk (Kg)
with	3,613	5,987	2,231	856
without	3,388	5,760	1,867	751

DHAS and SCC Research

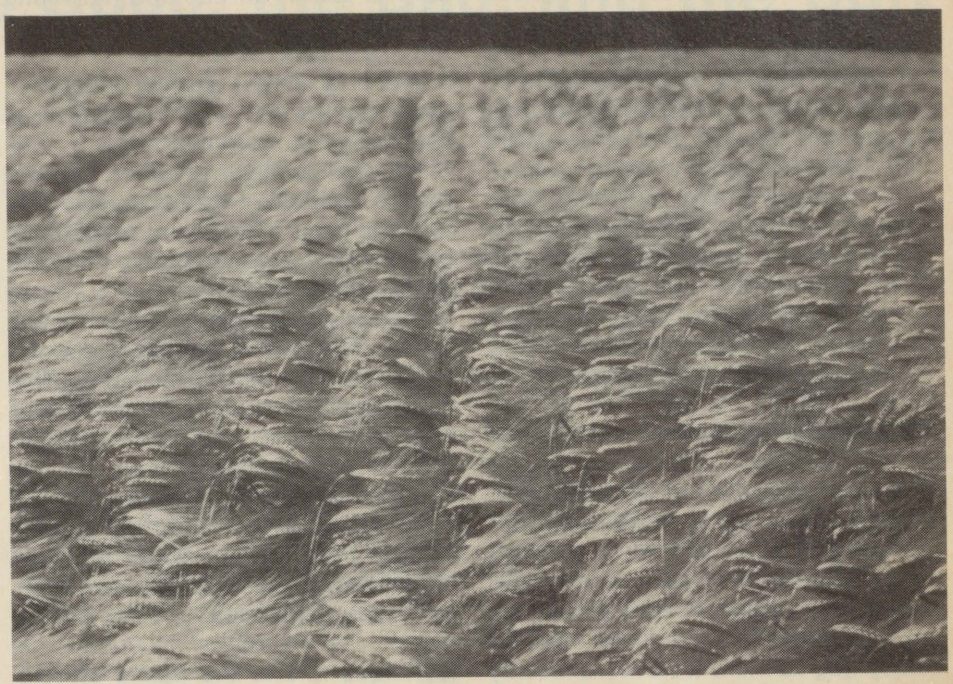
As a result of the continued growth of the SCC program, an important data bank has been created at DHAS. Different research projects have examined the heritability of SCC, the genetic and environmental factors influencing SCC, and the relationship of SCC with clinical incidence of mastitis, with milk, fat, and protein production, with conformation traits, and with total milking time. Somatic cells play a role in milk quality, too, and, in consequence, in the properties of milk products.

While somatic cell count levels are regarded as a measure of udder health, more recently they have been observed to be related to the cow's nutritional status. Vitamin A, beta-carotene, Vitamin E, and selenium deficiencies have been associated with high cell counts. Meanwhile, SCC continues to be one of the best indicators of subclinical mastitis.

FLASHBACK TO 1981 when some of the principals involved in DHAS in 1966 gathered to celebrate the 15th anniversary of DHAS. Above, left, former Dean George Dion and the then Dean L.E. Lloyd, and, right, Herb MacRae, now Principal of Nova Scotia Agricultural College, John Moxley, Director of DHAS, and Peter Hamilton, now Registrar, of NSCA.

Changes in the Quality of Feed Over the Last 20 Years

by Serge Lussier
Department of Plant Science



The 1985 Quebec crop area estimates indicate that for the first time barley is now grown on more hectares than oats, quite a change from the early 60s.

The quality of the feed fed to dairy animals has changed markedly over the last 20 years. The data available from the Dairy Herd Analysis Service (DHAS) and other sources indicate a slow but fairly steady improvement over the years. A large part of this change has come from modifications in the dairy farmer's management of his fields. The good farmers long ago understood that profitability is measured not only by the amount of milk produced but also by the efficiency with which dairy animals convert the feed produced on the farm into milk. The not-so-good farmers took a lot longer to understand and many still don't.

Twenty years ago, many farmers were still under the impression that field management consisted in harvesting whatever grew in the field, without much regard for quality. Quantity was what you looked for. The standard production package for hay production went as follows. Oats were normally used as a cover crop for a mixture of red clover and timothy with some white clover, alsike clover, and other species added in to provide better pasturing. The oats were harvested for grain and the straw baled for bedding. In the second year, the clover and timothy hay was harvested in July and the regrowth was pastured. The varieties of red clover that were available at that time usually did not make it through the second winter. Because of this problem and of the low number of plants of other legume species in the stand, the farmer was then basically left with a timothy field soon to be laced with couchgrass, dandelions, and other notorious weeds.

The net result of this scenario was a low overall quality diet for the cows. Oats are not as high in quality as barley or wheat, their fibre content being high due to the thickness of the hull. One redeeming aspect of oats, however, is the high quality of its protein. In the second year the hay contained a good proportion of clover but was harvested much too late by today's standards. As was mentioned before, quantity was more important than quality, and this was the main reason for the late harvest. This hay cut was followed by pasturing whatever regrowth came along. The third and subsequent year usually saw the hay fields yield a timothy hay mixed with weeds because the clover had died. The lack of fertilization certainly did not help the stands, whether yield, quality, or winter survival was concerned. As long as legumes were present, the protein content would stay somewhat higher since they produce their own nitrogen. When the field became mostly timothy the low level of fertilization, and especially nitrogen, caused a marked decrease in protein content over and above the decrease in total yield.

An analysis of the available statistics indicates that in 1963 oats made up 90 per cent of the area seeded to cereals in Quebec, while barley was at one per cent. At the same time, alfalfa was to be found on only six per cent of the hay land in Quebec, a rather meagre proportion. The reasons for this state of affairs are related to soil factors and tradition. In many areas of Quebec the soil was acidic, ill-drained, and of low fertility. This relates both to the nature of the soil and the management practices that are used in farming it. The poor state of many soils in this province prompted farmers to choose the crops that did best on them, namely oats, timothy, and red clover. The other important factor comes from the fact that Quebec is capable of producing decent yields of seed of those crops whereas alfalfa seed production is non-existent here.

All that has been said already does not explain *why* farmers were not using better soil and crop management techniques. We might be tempted to believe that the necessary information was not available to farmers. However, when one looks around a bit, it is easy to find the necessary material. For example, in the mid-1950s, the *Macdonald Farm Handbook* spelled out a series of hay and pasture management practices that bear an uncanny resemblance to those used today.

The answer has to be sought somewhere else. Agriculture is an occupation that is steeped in tradition and farmers are notoriously reluctant to change their management techniques. The reason for this is very simple. When you are somewhat successful in such a risky business, you are weary of changing a practice that has worked for you, albeit not perfectly. You are

ready to take a yield or quality decrease on a yearly basis in order not to have a complete disaster in any particular year. The major difficulty with this attitude is that it is even difficult to introduce techniques with a proven track record. One case in point is tile drainage. The first farmers who used this system were often ridiculed, their neighbours saying that they were "burying their money in the ground, never to see it again." But what these good people failed to see was that tile drainage is not an end in itself but permits more timely operations, better yields, and a wider choice of crops. The same scenario goes for many other innovations in farming.

Milk Marketing Boards Introduced

The situation has changed slowly, however, due mainly to the effect of the better, leading farmers on the rest of the group. During the late 1960s, milk marketing boards were introduced in Quebec and this stabilized the market, giving farmers a bit more leeway to try new techniques, On the other hand, it might be argued that this "coziness" or cushioning from market fluctuations made some dairy farmers even more reluctant to change than before. The large increases in production costs of the 1970s convinced many dairy producers that the old ways were maybe not the best ways.

During this period, tile drainage work was accelerated, crops changed and production practices followed. In the mid-70s, oats accounted for less than 50 per cent of the total area seeded to cereals (including corn) in the province, a major contrast to the mid-60s. Corn was becoming an important crop both as grain (54,000 ha) and silage (40,000 ha). Alfalfa mixtures represented 14 per cent of the hay area, double the 1965 figure.

At this point, it might be interesting to do a short comparison with Ontario. In 1975 alfalfa was used on half the hay area in that province and silage corn was produced on 139,000 ha. The corn comparison does not hold because of the different climatic conditions in the two provinces but the difference in alfalfa used is more intriguing. Whether Ontario dairy farmers are more advanced than Quebec dairy farmers is a highly debatable point but, in this aspect, the former are showing the way ahead. In the last 10 years, the evolution has continued so that alfalfa is now used on 20 per cent of the hay land in Quebec, the silage corn area has stabilized at 85,000 ha and grain corn is grown on 220,000 ha. Along with these changes in cropping patterns, a shift is evident towards earlier harvesting, better variety selection, more fertilization, and improved hay curing and storage practices.

This last point has not been touched on yet, although it is of crucial importance in maintaining whatever quality is in the hay crop when it is cut. Two important new techniques have helped immensely in the improvement of hay quality. The first is the introduction of forced air hay dryers for barns. This very simple apparatus consists of a large fan (90 cm diameter) and a duct that runs along the floor of the hay storage barn or loft. The hay bales are then stacked around this duct and the air flow from the fan slowly removes moisture from the hay. As can be seen, no supplemental heat is used, greatly decreasing the operating costs. This technique allows the baling of relatively high moisture hay, therefore reducing the lag time between cutting and storage. Previously, this period was so long that the hay had a good chance of being rained on and, therefore, leached of its nutrients. At the time when the first cut of hay should be taken (early to mid-June) rainfall is frequent (those who attend the Ormstown fair regularly can testify to that) and haying often difficult. Farmers who use their hay dryer to full advantage can produce high quality, nutritious hay.

Advantages of haylage

Haylage has brought this advantage one step further by again reducing the period of time needed to dry the hay. Whereas dry hay is stored at less than 20 per cent moisture and barn dried hay at 30-35 per cent moisture, haylage can be put in the silo at 50-60 per cent moisture. This often means less than one day in the field after cutting, compared to three and four days with dry hay. Haylage is also less manpower hungry than a hay system, but it has the major disadvantage of being expensive to operate. The barn dryer system is probably the norm across Quebec at the present time. If offers the best financial returns on investment of any hay handling system.

Corn storage is undergoing the same type of change that has characterized hay storage. A balance is being sought by dairy farmers between storage costs and feed quality. Research results, including some excellent data produced by Mr.H. Garino of the Animal Science Department, show that it might be possible to achieve both aims at the same time. Crib storage is probably the lowest cost system that can be used and the feed quality is very good. High-moisture ear or grain corn systems provide even better feed quality with slightly higher storage costs.

The other aspect of feeding that is important in Quebec is pasturing. Most dairy farmers still pasture their cows and some rely heavily on their pastureland to provide not only exercise but also a sizeable portion of their feed. If care is not taken to ensure a proper balance of nutrients considering the seasonal changes in pasture quality, the animals will respond with varying milk production efficiencies, thereby reducing profits. Determining the feed value of a pasture is a difficult task and this makes the job of ration balancing rather complicated. The other aspect is that much of the pasture land in Quebec is difficult to improve because of stoniness or slope or both. This meant for a long time that the farmer who had this type of land did very little to improve its quality. Over the past 20 years, new techniques such as direct seeding, better herbicides, and more use of birdsfoot trefoil have all made pasture improvements more likely to succeed and be used. The good dairy farmer of 1986 realizes that net profit improvement will come from using all of his land to its full potential.

Acceptance of these new techniques requires from the farmer a willingness to change that is not evident everywhere. Even today, it is possible to find many farms that have not put in practice the techniques necessary for feed quality improvement. These are, however, getting to be fewer in number as the cost-revenue balance becomes more critical. The example of the better farmers in any particular community will slowly rub off on the other ones. These leading farmers have always been and will continue to be the most powerful motor available to power technical innovations through the agricultural community.

Growth Hormone for Dairy Cows

The Good, the Bad, and the Ugly

by Professor Elliot Block
Department of Animal Science

Back in 1937 it was shown that growth hormone (then known as pituitary extract) boosted milk production by dairy cows. The problem was that the only source was from slaughtered cattle, which was insufficient to supply the potential market. Now, through genetic engineering, we can artificially produce large quantities of the hormone in the laboratory, thereby making the hormone available to many people (and cows) by virtually any pharmaceutical company.

The Immediate Effect of the Hormone on Production

By injecting growth hormone every day to lactating cows researchers have shown increases in milk yields from 10 per cent in early lactation to over 40 per cent in late lactation without changing milk fat or protein percentages. These results were obtained using high producing cows that were fed extra nutrients to meet the demands for milk production. Therefore, for the sake of argument, let us say that a farm can increase its milk production by 25 per cent when this hormone is used. An additional important point is that the hormone does not show up in the milk.

The Immediate Effect of the Hormone on Health of Cows

Already in our high producing cows we have a host of problems: mastitis, milk fever, ketosis, breeding problems, insufficient feed intake, etc. The use of this hormone will probably increase the incidence of these problems unless dairy producers increase their feeding and management skills. More attention will have to be paid to milking routine and equipment, feeding strategies, nutrition, heat detection, and so on. As of yet we do not know if any direct effect exists of injecting cows with growth hormone on calf size, heifer growth, or reproductive performance; potentially, these exist (i.e., increased calf size and more rapid growth) but we have no evidence yet.

Judging from the speed of research and development many people feel that the hormone will be marketed commercially by 1988. Many challenges face us in the near future when the hormone comes into use. With advance planning many problems can be avoided and farms can become more profitable; without this planning, we can wind up in total chaos. Let us examine some of the challenges that face us and how to make them work for the farmer.

Challenge No. 1: *A 25 per cent increase in milk production would force farmers to produce milk over their quota and add to the surplus milk supply.*

Possible solution: The logical solution is to cull the herd by 20-25 per cent, thereby allowing farmers to produce within quota and to be more profitable by maintaining 20-25 per cent less cows, calves, and heifers but maintaining production. This would also give farmers more available land to grow more of the farm's feed needs. There are other possibilities, including increased marketing strategies to increase consumption of milk products and exports, purchasing additional quota in advance of marketing of the hormone, or finding other outlets for milk if the market is favourable (lamb, veal, pigs, etc.).

Challenge No. 2: *By culling the dairy herd by 20-25 per cent (including heifers), the price of beef will probably decrease, hurting our beef producers.*

Possible solution: To reduce the likelihood of this happening, a joint cooperative effort must be made to limit cull dairy beef by the dairy and beef industries. Large export sales at very favourable prices would limit the impact of culling dairy cows as would increased use of nurse dairy cows for the beef industry, recipient cows for embryo transfer, and the use of cull dairy beef for export canned meats. These would require forethought, planning, and cooperation.

Challenge No. 3: *How will we assign official production records and BCAs to cows when different farmers will probably use the hormone differently?*

Possible solutions: This one is easy, but again needs forethought and planning by the breed associations and milk recording leaders at the federal, provincial, and local levels. One could include a "suffix" of a letter or two (i.e., "GH") with the BCA and/or yearly production. Additionally, the possibility exists to correct production, mathematically, to hormone treated or non-hormone-treated production values after we know the exact effects of the hormone (similar to mature equivalent or fat-corrected milk adjustments). If all cows on official test are being given the hormone, then nothing needs adjusting (except a readjustment of base level BCA values).

Challenge No. 4: *How will we rate bulls at artificial insemination centres for milk production potentially transmitted to daughters?*

Possible solutions: Again, this one can be easy with forethought and planning; without, it could be disastrous. Decisions must be made by governments, breed associations, geneticists, and statisticians as to the handling of this matter. The decision could be made: to develop proofs on bulls with or without hormonally treated daughters; to list two proofs for bulls, one developed with and the other without hormonally-treated daughters; to develop correction equations to equalize bulls regardless of how the proof was developed.

Challenge No. 5: *A 20-25 per cent decrease in dairy cattle means less feed, supplements, drugs and veterinarians needed.*

Possible solutions (and explanation): Challenge No. 5 is not 100 per cent correct. We have eliminated the maintenance feeds and supplements by 20-25 per cent as well as decreasing the feeds required for calves and

heifers. Additionally, we may find that new types of supplements are needed for hormonally-treated cows. If these are added to the probability that not all farms will use growth hormone, then we may only see a small reduction in feed sales. If we reduce cattle by 20-25 per cent, the pharmaceuticals will not decrease by this percentage because there may be more needs for the cows remaining; however, total pharmaceutical sales will decrease. For these same reasons, the number of veterinarians required will not decrease at the same rate as dairy population. However, we may see an increased need for consultants available to farmers for help with nutrition, reproduction, genetics, and general management. The possibility for Challenge No. 5 occurring is good and the agribusiness pharmaceutical companies, veterinarians, consultants, and agrologists serving the dairy industry had better begin some forward planning to avert hardship.

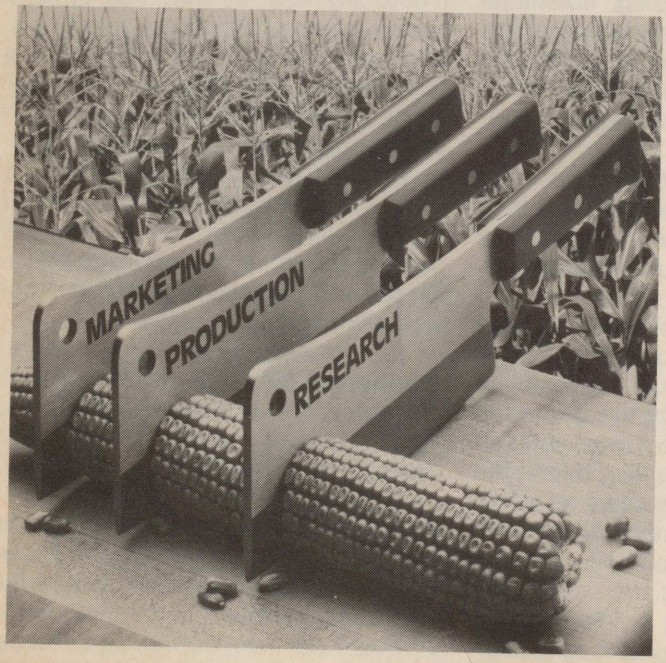
The challenges outlined above are going to be reality when the hormone is marketed. The effects may be small or large depending on the number of farmers using growth hormone. Regardless of the magnitude of the effects, they will occur. This does not present problems if *forward planning* is done *NOW* rather than waiting to see what happens, because then it may be too late, thus creating chaos in agriculture. Some people argue that milk production has increased dramatically over the past 25 years and we all lived through it so why bother worrying. This is true to an extent; however, growth hormone can increase milk production in one year as much as other advances have achieved over the past 25 years combined. This will not be easy to swallow if it is not planned out.

FLASHBACK TO 1985 when Humberto Monardes and Robert Moore gave a tour of DHAS facilities for a group from Peru. Over 1,000 visitors from Canada and other countries tour the facilities each year.

Assuming that the research on growth hormone goes well with no adverse effects found, it will be available soon. The hormone can be good, bad, or ugly, depending on how it is perceived and handled by the industries involved. We researchers want growth hormone to be a good (great) tool for producers, and it can be *IF* everyone involved starts planning for it.

FUNK'S RESEARCH... OUR INVESTMENT FOR YOU

FUNK'S G HYBRID



Corn growers are seeing a new level of performance from Funk's G-Hybrids

It's the result of an extensive breeding program made possible by Funk's connection with the worldwide resources of Ciba-Geigy. The selection of inbreds from this vast genetic pool allows our Canadian corn breeders to test a tremendous volume of potential hybrids under many different stress conditions. Only the very best are then selected for use in your fields.

Thousands of hybrids enter Funk's breeding program every year, yet only one or two ever make it to market. An exhaustive selection process, with tests at every stage of breeding, ensures only the highest performing hybrids come out of Funk's breeding program. That's why it takes years to produce a single Funk hybrid, and why we're introducing new experimental hybrids every year.

All of our research dollars go into Funk's hybrids for one reason—so you get the most dollars out in harvestable yield.

FUNK SEEDS
division of CIBA-GEIGY SEEDS
CIBA-GEIGY CANADA LTD.

GENE TRANSFER INTO ANIMALS

How is it done? What is its potential for the dairy industry?

by Professors U. Kühnlein and K.F. Ng Kwai Hang
Department of Animal Science

At a recent luncheon announcing the appointment of Dr. Urs Kühnlein to the new Shaver-NSERC Industrial Research Chair Dr. Donald McQueen Shaver, left, and Dr. Urs Kühnlein.

In 1979 Palmiter *et al.* reported the successful introduction of a growth hormone gene into the germline of mice. Such engineered mice and their offsprings grew at twice the rate and to twice the size of their normal counterparts. This accomplishment has raised considerable excitement in basic as well as applied biological science. It is the key for studying gene expression and gene interaction in a whole organism rather than in a few special cultured cell lines. This possibility will undoubtedly lead to new insights into the mechanisms of development, cell differentiation, immune response, and endocrine regulation and thus provide the basis to understand and cure many human diseases.

What is the potential of gene transfer in animal breeding? Are we now able to alter the genetic make-up of farm animals at our will, produce gigantic pigs which grow at twice the normal rate, triple the egg production in chickens and create cows which produce twice as much milk? Much basic research has to be done to test whether this is indeed possible and thought has to be given whether it is desirable However, the basic experiments carried out in mice indicate that such manipulations are in the realm of the possible.

The properties of an organism are directed by several thousand genes which are present in identical copies in each of the millions of cells which compose the organism. Genes are stretches of long linear polymers of deoxyribonucleic acid (abbreviated as DNA) which are located in the cellular nuclei in compact structures called chromosomes. The DNA molecules contain the information for the synthesis of the proteins which, in turn, control all biological processes of the organism. They act as catalysts (enzymes) to guide the chemical reactions necessary for the synthesis of degradation of biological molecules, as regulators of gene expression (hormones), or as structural intracellular and extracellular elements. Thus genes are the blueprint of a biological system. They are passed on to future generations via the germcells (oocytes and sperm), thereby ensuring the perpetuation of the characteristics of the parental organism.

Molecular biology, that is the understanding of biological systems at the molecular level, is essentially the elucidation of the function and interaction of gene products and the discernment of the intricate network of controls of gene expression which determine development and the response of an organism to external factors.

Any lack or alteration of a given gene will change certain traits of the organism and its offspring. For example, deleting a gene which codes for a protein which is involved in the synthesis of a colour pigment of the eye will result in an altered eye colour. If this deletion has occurred in the germ cell line, this new trait will be passed on to future offspring. Another example is hemophilia, a genetic disorder caused by the malfunctioning of a gene which codes for a protein involved in blood clotting.

Clearly, if one could isolate individual genes and integrate them into the genetic material of the germ cell, one could permanently alter the blueprint of an organism, create species with new properties, and, in the case of human genetic diseases, perhaps cure certain disorders.

The isolation of single genes has indeed become possible, mainly because of the discovery of certain enzymes which permit the dissection of long DNA molecules. Such stretches of DNA containing one or several genes can be integrated into circular DNA molecules (plasmids) which, when introduced into bacteria, replicate to about a thousand copies per cell. Such bacteria can be further grown to high concentrations in fermenters, yielding an abundant source to reisolate the originally introduced gene as well as the protein synthesized from this gene.

This discovery has had a tremendous impact in the field of molecular biology. Proteins which hitherto had been painstakingly isolated from large amounts of animal tissue can now be easily obtained in large amounts from bacteria, thus opening the way for chemical analysis and characterization. Genes can be isolated,

sequenced, altered, and compared and questions as to how their expression is regulated can be answered.

The potential of this new technique has been quickly recognized by the industry, and much progress in biological research will come from their multibillion investments in biotechnology. One of the applications which has been realized is the large scale isolation of gene products like hormones for use in medical therapy. For example insulin — used for the treatment of diabetes — which previously was isolated from pig pancreatic tissue by a labour intensive process, can now be prepared in large quantities from bacteria or yeast and has already been approved for marketing. Another bacterially produced human hormone on the market is growth hormone — used to treat dwarfism — and clinical trials have been started with tumor necrosis factor which leads to regression of certain types of tumors. Undoubtedly many more hormones like interleukine 2 (cancer treatment) or blood clotting factors (treatment of hemophilia) will soon be mass produced with this technique.

The possibility of isolating large amounts of a given gene has also opened the gate to introduce altered or foreign genes into organisms, thereby permanently altering their genetic make-up. In Japan this technique has been used to construct bacteria which produce the chemical compound responsible for the scent in geraniums and other flowers for use in the perfume industry. Less esoteric, bacterial strains are now being developed which can efficiently degrade cellulose into sugar and might be used in the future to produce sugar from old newspaper or could be introduced into the rumen of cows to increase the efficiency of cellulose digestion. Undoubtedly, engineered microorganisms will become an important tool in many industrial processes.

While microorganisms are relatively amendable to genetic engineering, higher organisms like plants or animals pose a more serious challenge. It is not only difficult to manipulate and introduce genes into eukaryotic cells, but it is also difficult to predict the consequences of gene integration due to the complexity of the biological system.

The basic technique to produce transgenic animals has been developed with the mouse system. Briefly, a female mouse is superovulated — stimulated to produce many oocytes — and artificially inseminated. The fertilized oocytes are then flushed from the oviduct. At this stage the genes contributed by the male sperm are not yet fused with the female genes but are present in two bodies, the nucleoli, which are readily observable under a microscope. Copies of the gene of interest are injected into one of the nuclei, followed by implantation of the oocytes into the oviduct of a pseudopregnant foster mother. Most of these implanted oocytes will develop and give rise to offspring. Gene integration is quite efficient and about 25 per cent of the progeny will contain one or several of the microinjected genes. The integration is stable and will be inherited in a mendelian fashion by future generations of mice.

Of course gene transfer has not been invented in the laboratory. It occurs naturally through fertilization when the male and female genes are mixed and then segregate at random to provide the genetic make-up of the off-spring. However, fertilization involves the transfer and reshuffling of thousands of genes, and the elimination of undesirable genes requires extensive backcrossing over many generations. In contrast, with genetic engineering a single gene can be introduced in a given genetic background.

Most important, genes which are introduced can be chemically altered to change their level or tissue specificity of expression. Expression is determined by a stretch of DNA which preceeds a given gene (called promotor). Hormones and other regulatory proteins interact with this sequence and determine the activity of a gene. Such controls often act in a cascade starting with the binding of proteins or other types of hormones to receptor sites on the cell surface. Such receptors are responsible for the tissue specific expression of a certain gene (i.e., not the same genes are turned on in liver cells as in cells of the mammary glands). By splicing the promotor region of a certain gene to a heterologous gene, the tissue specificity of its expression can be altered. For example, the additional growth hormone gene introduced into mice was fused with the promotor for the metallotheinine, a metal binding protein which is expressed in the liver. As a consequence, the additional growth hormone is expressed in the liver, rather than in the cells of the pituitary gland where growth hormone synthesis normally occurs. In addition, normal feedback controls which regulate the synthesis of growth hormone are circumvented, resulting in extremely high levels of hormone production in transgenic animals. Thus, genetic engineering not only allows the introduction of single genes into a given genetic background, but also to manipulate the tissue specificity and level of its expression.

The application of gene transfer to improve agricultural lifestock is still subject to severe limitations. One of these is the technique itself. Until now it is only possible to introduce genes in addition to those already present. Targeted gene transfer, that is the introduction of genetic material into or near specific genes has not yet been achieved. It is, therefore, not possible to manipulate genes which are already present in the genome, and phenotypic alterations by gene transfer are restricted to traits determined by dominant genes which can override preexisting cellular control mechanisms. However, targeted gene transfer has been achieved in yeast and based on preliminary experiments might soon be possible in higher eukaryotes.

Most limiting in applying gene transfer for the improvement of agricultural lifestock is the paucity of our knowledge as to which genes determine economically important traits. Despite the fact that traits developed through classical breeding are phenotypically simple, they are generally determined by a multitude of interacting genes and little is known about the underlaying molecular basis. Much research has therefore to be done to identify such genes by analyzing animals with desirable and undesirable traits.

Such analysis is difficult and time consuming and a more expedient approach might be to manipulate genes in biological pathways expected to be implicated in productivity, followed by testing whether overexpression of such a gene will result in an improved phenotype. An example is the growth hormone which not only increases growth, but also affects many other metabolic pathways. Injection of additional growth hormone has

been shown to improve feed efficiency as well as lean to fat body weight in pigs and to dramatically increase milk production in dairy cows. It is, therefore, not surprising that many laboratories are concentrating on introducing additional growth hormone genes into agricultural animals. This has so far been accomplished in pigs, sheep, rabbits, and poultry and results pertaining to the performance of these animals should soon be forthcoming.

However, one has to keep in mind that gene interactions in higher animals are complex and that improvement of a single trait might be detrimental to the overall productivity of the animal. Mice containing an additional growth hormone gene fail to develop pituitary somatotroph cells which are the natural producers of growth hormone, show abnormal sexual differentiation of certain liver cells, and lead to impaired fertility in females. It indicates that any gene manipulation has to be followed by extensive performance testing to evaluate the effects of gene alteration.

What will be the impact of biotechnology in animal agriculture? Most likely it will first be in auxiliary areas like feed production or the manufacturing of vaccines, antibiotics, and hormones. Gene transfer to improve productivity traits of farm animals is more distant. Much basic research has to be done to identify genes which determine economically important traits and to study the regulatory processes which determine the expression and interaction of these genes. Gene transfer itself will be the most powerful tool to achieve this goal.

Application of biotechnology could solve many of the problems which are facing our dairy industry today. The biggest costs for milk production are feed costs and capital expenses for land, buildings, and equipment. Therefore, any production system which could significantly cut down on production cost would be very attractive. Increasing milk production alone is not desirable because of the oversupply, whereas producing the same amount of milk with fewer cows and, therefore, less barn space, labour, and feed would do much to improve the present situation. Over the past 15 years we have seen a doubling of the amount of milk which is used for cheese production. For the cheese industry, the availability of milk containing high proteins of the appropriate types which result in increased cheese yield and quality would be an immense asset. The immediate benefits would be reduced transportation costs, higher manufacturing plant efficiency, and reduction of waste disposal requirements.

Recombinant DNA technology offers much promise for the two examples given as problem areas in the dairy industry. Over a decade ago, it was demonstrated that injection of growth hormone could increase milk production in dairy cattle. Several more recent studies have shown that exogenous growth hormone administration over several day periods to lactating cows can increase milk production by 15 to 30 per cent depending on the stage of lactation. Another interesting feature of these experiments is that feed efficiency increased dramatically. The prospect of simultaneously improving milk production and feed

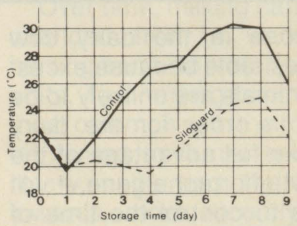
SILO® GUARD

For over 20 years profitable livestock producers have relied upon "SILO GUARD" for treatment of all types of silage. Now recent controlled research at McDonald College, Dept. of Agricultural Chemistry and Physics has proven "SILO GUARD" to be effective on high moisture hay as well.
"SILO GUARD" is easy to apply through the use of a Gandy Applicator to either round or square bales resulting in a better quality hay.
Through a unique patented process "SILO GUARD" helps reduce heating and mustiness in baled hay. (max. 25% moisture). This means you can bale sooner without worrying about losing valuable leaves and small stems.
"SILO GUARD" a safe, reliable, non corrosive food grade product is one of the many ISF products available. Consult your rep for further details. Trust ISF, Quality products for over 80 years.

Effect of SILO GUARD on the weight loss and dry matter loss of baled hay!

Treatment	Weight Loss (%) (average 5 bales)	Dry Matter Loss (average 5 bales)
Control	22.7	13.6%
Silo Guard	16.0	6.6%

Results of research conducted at McDonald College on hay baled at 22.5% moisture. Dry matter loss was reduced by over 50% and weight loss by 30%.



Effect of Siloguard on the temperature of baled hay.

THE MARK OF QUALITY PRODUCTS®
ISF
INTERNATIONAL STOCK FOOD CO. LTD.
P.O. BOX 1024, CAMBRIDGE, ONT.
N1R 5Y2 (519) 622-2730

Dairy Farming in Aoteoroa

"The Land of the Long White Cloud"

by Dr. John Moxley
Director, DHAS

Kay Moxley views Howard Hawes's 250-cow Jersey herd at Matamata, North Island.

To many Canadians New Zealand is an intriguing country to visit. In October 1985 the International Dairy Federation held its annual meeting in Auckland. This writer had the good fortune to be a member of the group of Canadians who attended the meeting. On this occasion a manager with the New Zealand Livestock Improvement Association prepared a three-week itinerary which provided an excellent overview of the dairy industry and the major scenic areas of the country.

New Zealand is about 1,000 miles from north to south. Its land area and population is about twice that of our three maritime provinces. The North and South Islands make up most of the land area. The South Island has 60 per cent of the total land area but less than 30 per cent of the total population. The mountain ranges, known as the Southern Alps, run along the western side of the island. That "long white cloud" unloads most of its rainfall along the west coast while the eastern plains around Christchurch have low levels of rainfall and in some areas irrigation is required for crop production.

The 80 million sheep are fairly well distributed across the whole country. On the South Island the sheep farms or ranches are more extensive. Over 90 per cent of the dairy cattle are on the North Island and in the western and central areas where the rainfall runs over 100 centimetres per year.

Dairy farming is very different in New Zealand. It is estimated that 95 per cent of the world's milk production is consumed in the country of production. With 2.2 million dairy cows and three million people, New Zealand is an exception. Eighty-five per cent of their milk is exported as dairy products to provide 20 per cent of their export income. This means they must produce milk at a low cost to sell on the

---

(Turn from page 17)

efficiency is very attractive for the dairy farmer. However, the long-term effects of this exogenous hormone on the cow's performance is not yet evaluated. Also, the administration of growth hormone requires daily injections since no sustained release implant is available for delivering the compound of interest. Therefore, at present, the administration of growth hormone to dairy cattle for the purpose of improving milk production is not practical because of the labour involved for the injection of each cow every day. On the other hand, one can expect to have similar results in increased milk production and feed efficiency if growth hormone production within the lactating cow could be elevated by the insertion of growth hormone genes through application of recombinant DNA technology. The continuous uncontrolled production of growth hormone in the dairy cow would be undesirable because excessively large animals are unlikely to be manageable. In order for the dairy industry to take full advantage of the effect of growth hormone gene, it will be imperative to control the time of expression of the recombinant growth hormone gene in the transgenic dairy cattle.

At the manufacturing level there is great potential for the engineering of various milk proteins in order to increase dairy product yield and improve quality. Research at Macdonald College has established that cheese yield is directly related to the amount of casein in milk. In future it will be possible to isolate the casein gene and insert extra copies of this protein into the cow's genome. This will result in production of milk containing higher amounts of casein and the use of such milk would give a higher cheese yield. The physico-chemical properties of proteins (including the caseins) depend on their sequence of amino acids. There are many possibilities for alteration of amino acid composition and sequence of the caseins through genetic engineering in order to obtain a protein which is more advantageous from the manufacturing point of view. For example, modification could be made to improve the thermal stability of casein during cheese making, the rate of textural development in cheese, and the ripening process of cheese.

Although the application of biotechnology for increasing milk yield and improving milk composition in dairy cows as described above is a long-term prospect (possibly 10-20 years) and may sound speculative, research in this area is going on and, who knows, maybe in the future this dream will come true.

world market.

The 16,000 dairy farms have an average of 60 hectares (150 acres) and 140 cows. Ninety per cent of these farms supply milk for manufacturing while the remainder provide the town fluid milk market.

Milk for manufacturing purposes is produced from pasture. Excess spring growth may be stored as hay or silage to provide sufficient feed for body maintenance during a one- to two-month period when pasture growth is not sufficient in their winter period. The milk producer's capital investment is in land, cattle, and a milking shed. Any tillage and silage or hay making mostly depends on custom work.

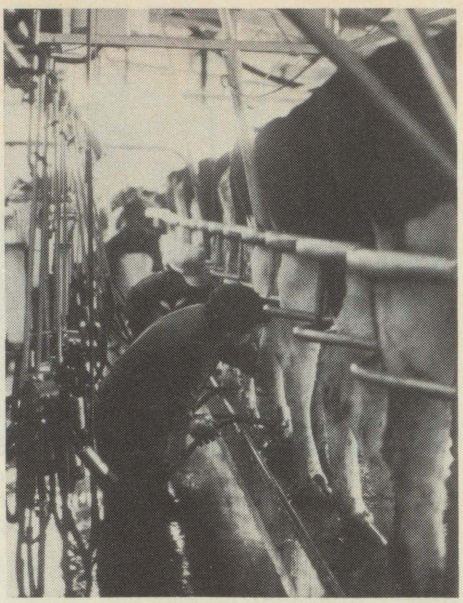
The five major concerns for milk production are pasture production, stocking rate, cow quality, calving time, and grazing management.

Pasture production depends on locality, weather, fertilizer, species, and drainage. The standard mix is perennial rye grass and white clover. Pasture growth and, therefore, milk production depend on the amount and distribution of rainfall. While much of the pasture area is on rolling land, surface drainage on the flat areas has improved pasture production. Fertilizer is applied both spring and fall.

Milk fat yield per hectare is more important than yield per cow. This means that the stocking rate is important. The average for the country is 2.3 cows per hectare.

Cow quality is also a major factor. Sixty per cent of the dairy cows are milk recorded. The cows that respond under the production pressures produce the herd replacements. The milk recording service has recently introduced a culling guide. This guide lists cows not in calf, the 15 per cent of the cows with the lowest production index, cows with somatic cell counts over 750,000 cells/ml of milk, cows with a calving date nine weeks after the planned herd calving date, and cows older than nine years. The average production for milk recorded cows in the 1983-84 season was 3,450 kilograms of milk with a fat test of 4.8 per cent and 165 kilograms of fat. The price of milk is based on milk fat with some cooperatives introducing a protein price component.

Calving is concentrated to take advantage of pasture growth. In most herds the cows calve in a six-week period. The culling guide above



Kevin King milking a 200-cow Holstein herd in a herring-bone unit near Nelson, South Island.

reflects the importance farmers give to time of calving. In some cases calving may be induced to reduce the calving period.

Dairymen put a lot of emphasis on grazing management. Fields are fenced to a size that cows will graze down in 24 hours or between milkings. Larger farms may further subdivide the herd by two or three age groups.

The objective of New Zealand dairymen is to milk the herd in less than two hours. The better units will handle 70 cows per labour unit per hour.

Over time, milking parlor design has changed from a walk through to herring-bone to rotary type milking units. The herring-bone units are the most common with the rotary type better suited to larger herds. The first rotary units had the cows facing inwards; more recently constructed units have the cows facing out with the milking carried on in the inner circle. One herd that was visited had a rotary for 48 cows. This unit made one complete rotation every 6½ minutes. This dairyman had his 632 cows milked well within the two hours. Last year this dairyman produced 770 kilograms of fat per hectare from his Jersey herd.

Herd management is geared to an efficient milking operation. The cows' tails are bobbed to speed up putting on the teat cups. In most cases washing and massaging the udder before milking has been eliminated. It is assumed that when cows are placed on fresh pasture daily the udders are clean. Milking speed is important and slow milkers are quickly culled. After milking an automatic sprayer is used to apply the equivalent of our teat dip.

Since the beginning of the century the dairy cow population has tended to undergo a breed change from the Shorthorn to the Jersey to the Friesian. In the last breeding season Friesians accounted for 60 per cent and Jerseys for 33 per cent of the artificial breeding services. The Friesian has gained popularity because its calves are easier to raise and the bull calves and cull cows have a higher sale value.

Many commercial dairymen alternate the breed of sire used. The average butterfat test of 4.8 per cent reflects the Jersey breeding in the population. It has been noted that within the Friesian and Jersey populations the grades have much higher breeding index values. In this case a grade animal must have three generations of identified ancestry with the sires all of one breed.

The dairy farmers are very much in control of their own destiny. The New Zealand Dairy Board was established to export dairy products. It purchases the dairy products from the cooperatives and sells them through a worldwide marketing agency. Its responsibilities also include other industry activities and the general development of the industry. The board has 14 directors. Eleven directors are elected by the dairy farmers with two appointed by the government and one by the board to represent the fluid milk sector.

Milk recording was initiated by the Department of Agriculture in 1909. In 1939 a "Herd Improvement Plan" was recommended and adopted, the object of which was "to increase the aggregate net income of dairy farmers." The Livestock Improvement Association operates under the direction of the New Zealand Dairy Board and is responsible for milk recording, artificial insemination, and providing detailed management information.

In spite of its relatively small size New Zealand demonstrated an ability to adapt to changes in the world market. This is particularly true in the dairy industry. While dairy farming is serious business in New Zealand, as a tourist, one cannot help but enjoy the friendly relaxed welcome you receive. As one New Zealander put it, in the country you will find "green – peace."

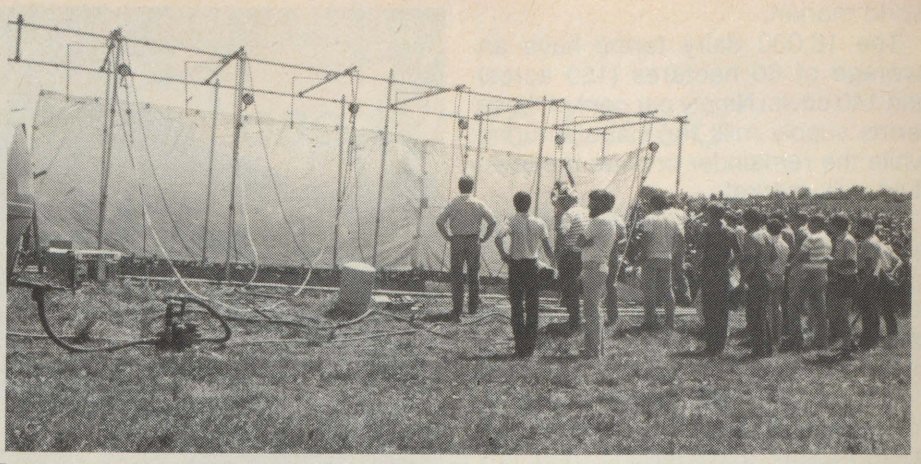
Farmers' Days at Lods Centre

by Serge Lussier, Department of Plant Science and Henry Garino, Department of Animal Science

The Annual Farmers' Days at Macdonald were held last year at the Lods Research Centre. There were practical demonstrations in the field on the research projects being carried out mainly by Plant Science, Soil Science, Agricultural Engineering, and Wildlife, such as:

- Variety testing of cereals, grasses, and legumes
- Growth regulator effects on barley
- Tillering effects on cereal yield
- Herbicide testing: cereals, alfalfa, and corn
- Red clover management
- High N rates for spring wheat
- Maximum yield of corn related to fertilization, irrigation, and population density
- Soil erosion by water
- High axle load and corn production
- Soil preparation and sugar beet production
- High voltage fencing.

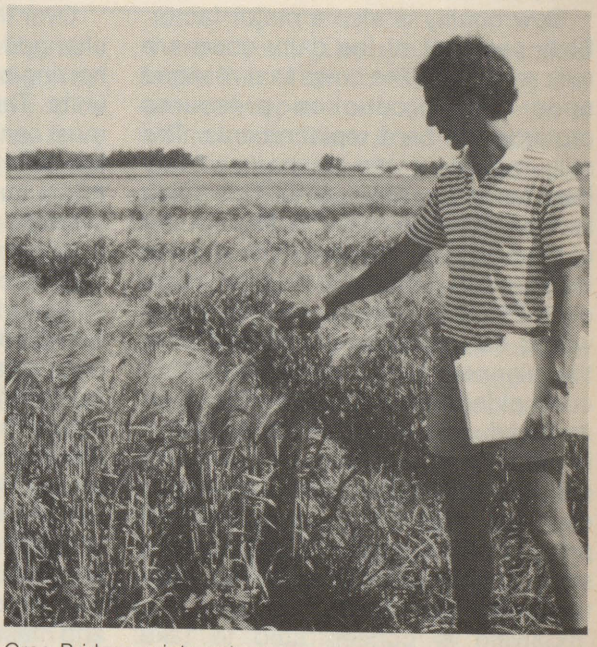
Our researchers, technicians, and students welcomed families and friends, explained their findings, and gave out information.



Farmers who attended Farmers' Days where quite interested in the set-up and results of the erosion simulation experiment conducted by the Renewable Resources Department. On many farms, erosion is an insidious and possibly explosive problem that requires immediate action.

In this photo Serge Lussier is seen discussing Plant Science's cereal breeding and testing programs with a group of Eastern Ontario farmers. This group was headed by Kathleen Ryan, a recent Mac graduate and now an Ontario Ministry of Agriculture and Food employee.

Plant Science graduate student Mireille Lacroux spent Farmers' Days explaining the problems associated with the persistent weed yellow nutsedge and the solutions she is looking at in her Master's research. The net seen over the barley plot is used to keep birds at bay.



Greg Bridger points out an on-going growth regulator experiment on barley. Greg is an '85 Mac grad and has begun graduate studies in Plant Science.

college. "Although I bring all my own food from home, the room in Laird, books, and travelling expenses to and from home have certainly taken a good part of the first installment," Eric told me and reminded me that school for the Dips starts early — on August 18th last summer for two weeks of farm practice on the college farm. Did Eric learn anything new? "Yes," he said, "though I'd seen it all before, I didn't always understand why. It had never been explained to me so the two weeks helped."

Back on the family farm where they milk about 35 cows, Eric said that he had more experience helping with the crops than with the animals. "David always looked after the feeding and the milking, and the rest of us did the field work. We grow most of our own feed: haylage, hay, of course, and barley for the dairy ration." He knows that the farm isn't big enough for three full-time operators, and he plans to work away from home for a while and then they will decide if they should all go together and make the operation bigger.

Students in the new Diploma Program spend two weeks on a farm in February as well as 13 weeks in the summer. "I'll be working for Garth Tracy in Shawville; he's got a dairy farm and milks about 45 head. He's taken Mac students before," Eric said. "I chose Shawville so that I could see something different and yet be close to home. When you've just turned 18, you don't know what you're doing in life and you don't want to be too far from home."

Eric said that some of the courses in the first semester were similar to those he had taken in biology and agriculture classes at school, but "we all found the first semester tough — some say that the second won't be as bad." We have 30 hours of classes a week plus homework." Some students would prefer just to have courses in agriculture Eric said, but he felt that the new courses in the program would help if he decided to go on for a degree or if he went looking for a job off the farm. Eric figures that not counting Christmas, he'd have two weeks off during the year. Not too much time for extra curricular activities but he did find time for soccer and volleyball during the fall term and had already been out cross-country skiing. He is also on the house committee for Laird Hall and that means weekly meetings and is president of the Dip I class.

"It's an honour for me to be associated with the Terry Fox Humanitarian Award program," Eric said, "I never thought of associating myself with that sort of person. I knew when he started running, but I only got interested when he got to Ottawa because we didn't hear too much about him before that. From then on I followed his run until it ended in Thunder Bay. I understood what he was doing and why he was doing it."

When I talked with Eric in early January he hadn't met any of the directors of the Award program or the winners, except for his classmate from Hull. He was, therefore, looking forward to January 17 and 18 when he would be going to Queen's University in Kingston. "It's an informal get acquainted affair for the participants and the Executive Administrator, Dalton McGuinty, and possibly some of the directors who include, among others, Terry Fox's mother. They had a gathering in Halifax for the Maritime provinces, this one is for Quebec and Ontario, and then there will be one for the prairies and one for B.C. and the Yukon."

Eric Roy said quite soon after I met him "I grew up on a farm and it's where I feel most at home. I wasn't sure what else I could do so I would like to make the best of what I do know I can do."

On a farm or elsewhere, Eric has the qualities for attaining real success in life and thanks, in part, to his having helped others he now has the generous help of the Terry Fox Humanitarian Award Program and has been able to continue on the road to success a little earlier than planned.

P.S.

Excellent Extension of the College

I want to let you know that the *Macdonald Journal* is being well received in other areas outside southern Quebec. Foremost, I must mention are the agriculture and food science articles which appear as a result of research and/or demonstration efforts by staff at the college.

At Macdonald, quite a bit of research is being conducted and the results can also be applied to a large extent in other areas outside southern Quebec. It is important, therefore, to continue to build on this emphasis in your publication. Pictures, graphs, and tables are an excellent way to help get the message across. We find, in extention, short articles with such support are most likely to be read and appreciated. The publication is an excellent extension of the college to the public and should never be taken for granted by potential contributors and staff at the college. Any co-operative efforts with other institutions, research agencies, private organizations, and their results should be outlined in the publication, too. Graduates who have some research results or a story to tell could also be of benefit and useful to the reader.

The university, college, and the *Journal* have a unique opportunity to explore the beneficial interaction amongst agriculture, food science, physical education, and the medical profession. Diets, food, and physical activity have a profound effect on preventing and alleviating many medical problems. Yet, in reality, the gap amongst these professions can sometimes be wide.

Keep up the good effort, in keeping the *Macdonald Journal* interesting, useful, and relevant to a wide readership, particularly the rural and extension people. What other institution in agriculture in Canada has its own long-standing and well recognized publication that has such wide distribution?

W.E. Kayler, P. Ag.,
Extension Horticulturist
Dept. of Rural, Agricultural,
and Northern Development,
Bishop's Falls, Newfoundland

New Subscribers

As well as my own renewal, please send a subscription to my parents. I am sure that they will enjoy the Journal as much as I do.

Jane Hilbers,
Windsor, Ont.

HARDWOOD DECLINE IN QUEBEC NO GOOD NEWS YET

by Professor J.D. MacArthur
Woodland Resources
Department of
Renewable Resources

The gradual decline and death of hardwood trees, particularly the sugar maples, which has occurred in recent years over a large area in southeastern Quebec has led to growing alarm. Losses to date are serious, and they are increasing. Although the hardwood forest area of southern Quebec is small compared with the northern softwood forest, it is much more valuable on a per acre basis. Furthermore, much of it is in the privately-owned woodlots and sugar bushes of the settled part of the province and these provide important resources to many people. The sugar maples alone are the source of some $40 million worth of maple sugar products annually.

Many owners, particularly maple syrup producers, have suffered losses that will reduce their annual incomes for years to come and the symptoms of the mysterious disease seem to be spreading and threatening more and more woodlot owners with significant losses of income. Because the disease affects a great many people financially it has been getting much more attention than is usual for forestry problems.

Symptoms

The disease was first discovered in the southeastern region of Quebec six or seven years ago. It was noted that the leaves in the upper parts of hardwood tree tops were smaller and less numerous than usual, that they turned yellow on their edges, and fell earlier than usual in the fall. As this condition became more severe, trees lost all of their leaves fairly rapidly and died. Another symptom was the unusual way in which the bark of dead trees fell off in large patches. As time has passed the symptoms have become more pronounced in the areas where they were first seen and were found over a larger and larger area of the hardwood forest. Aerial photographs taken in severely affected areas show extensive concentrations of dead tree tops where almost all of the trees have suffered what looks like fatal damage.

The severity of the disease appears to be related to the health of stands and the quality of the soils they grow on. However, it does not seem that any stand is immune although good stands on good sites may be less severely affected. Often, however, it has been observed that trees, and even stands, that should be in top shape are being suddenly and mysteriously affected. It appears that once the symptoms appear, the affected trees do not recover and that sooner or later they die.

Results of studies

Extensive studies of the problem are being done by provincial and federal researchers with the objectives of: 1) determining the extent of the problem; 2) evaluating how serious it is; 3) determining the cause or causes, and 4) finding ways to eliminate the cause or, at least, discovering or developing practical corrective treatments. Many affected stands have been examined and some preliminary results have been obtained.

The decline appears to be getting worse and to be spreading throughout the hardwood stands of southern Quebec, the neighbouring New England States, and Ontario. The most serious effects have been found in stands on poorer soils but the symptoms are found in all types of stands. Effects vary from almost total loss to slight. While the sugar maples have been the most talked of, other hardwood species are also affected.

Studies have not yet discovered a definite principal cause of the disease. Researchers believe that the disease is caused by one or more of the following stresses:

1. three winters out of four with very light snow cover;
2. the February thaw in 1981;
3. heavy defoliation of hardwoods by the forest tent caterpillar;
4. droughts and frosts when the trees were susceptible;
5. over-tapping of sugar bushes;
6. removal of non-maple species from sugar bushes;
7. effect of acid rain on soils and leaves over a long period of time;
8. some other unknown factor.

Some of these stresses have been largely ruled out. Others are suspected of weakening trees and making them susceptible to effects of acid rain which, although this is not definitely known, is strongly suspected of being the principal or final cause of the losses.

Research to obtain information on rates of decline and death and on the spead of the disease continues. The major concern now, however, is to discover the cause of, and a cure for, a disease that has generated widespread public concern and has inflicted serious losses on many woodlot owners.

Discussion

It is extremely difficult to discover how any one of the several stress factors may be affecting trees. The difficulty is even greater when it is recognized that the decline may be a result of the combined effect of two or more stresses. For there to be a reasonable chance of success a large, expensive, and possibly prolonged research program is likely to be necessary. Since losses are already serious and are on the increase, the need for a solution at the earliest possible moment is clear.

As research has progressed the findings have led to a growing suspicion that acid rain is the major, and perhaps the sole, cause of the problem. The fact that several tree species are similarly affected on a wide range of soils and topographic situations and over a large area provides support for this view. It will, however, remain a suspicion until research results prove that acid rain is, or is not, the cause. Even elimination of all the other known stresses as possible causes would not prove acid rain to be the cause. Possibly, as was the case with the birch dieback disease, the cause may never be known.

Canadian Pacific Fellowship

Three McGill University graduate students have received Canadian Pacific Fellowships to conduct research aimed at improving Canadian agriculture through biotechnology.

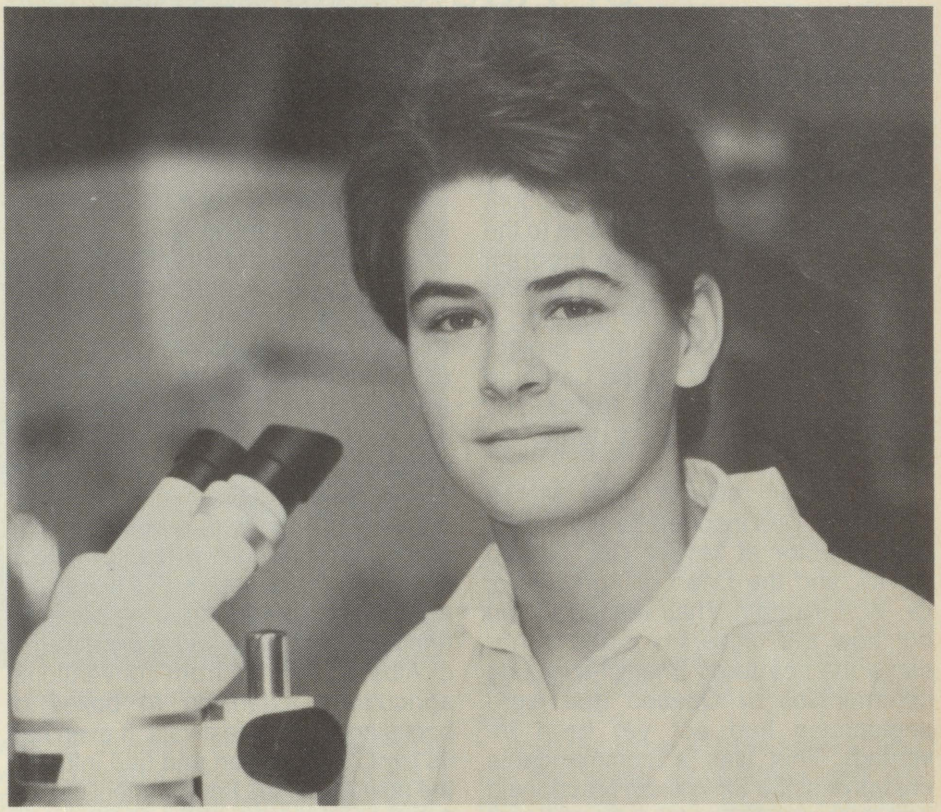
The fellowships, presented last October by F.S. Burbidge, Chairman, Canadian Pacific Limited, are part of a four-university Western Canadian Agricultural Research Program funded by a $1 million grant from Canadian Pacific. The fellowships provide each student with $11,000 a year for up to three years, bringing the total value of the fellowships to $99,000.

One of the three recipients, Helene Gadoury, of Laval, Que., is working with Professor Alan Watson in the Department of Plant Science at Macdonald.

Miss Gadoury is involved in research aimed at developing natural herbicides designed to combat weed infestation of prairie cereal crops. Hemp-nettle and perennial sow thistle are two of the 20 most important weeds that threaten production of western Canadian crops. Chemical herbicides provide only limited control of these weeds in cereal crops and, in the case of canola (rapeseed), chemical control is currently not possible. As well, chemical herbicides create problems such as contamination of run-off water and an increase in weed resistance.

Biological control, particularly with plant pathogens, could offer solutions to many of these problems. Miss Gadoury's research involves the evaluation of endemic fungi as a bioherbicide for hemp-nettle and perennial sow-thistle.

Dr. Kelvin Ogilvie, Canadian Pacific Professor of Biotechnology and director of McGill University's Office of Biotechnology, believes the work being done by biotechnological researchers at McGill and other universities across Canada may be the key to improving many of the perplexing problems facing western Canadian agriculture.



Helene Gadoury

"When the Western Canadian Agricultural Research Program was established last year, I believe an important step was taken to recognize the beneficial aspects of biotechnological research. Thanks to Canadian Pacific's sponsorship, the private sector now is beginning to realize the importance of biotechnology," Dr. Ogilvie said.

In presenting the Canadian Pacific Fellowships, Mr. Burbidge congratulated McGill's Office of Biotechnology and stressed the importance of continued biotechnological research.

"Biotechnology, in its broadest sense, describes techniques for developing products through the understanding and manipulation of biological activity. It has been described as one of the most important industrial activities of the century. McGill is a world leader in biotechnological research. Work conducted here I'm sure will lead to significant advances in improving Canada's most important renewable resource — agriculture," Mr. Burbidge said.

(Continued from page 26)

Until more is known little if anything can be done to control the disease. Woodlot owners are advised to limit disturbances of their woods to a minimum. It has even been suggested that sugar bushes should not be tapped to give the trees their best chance to resist the disease. Because of the effect this would have on income, this would not be a popular suggestion. Some owners, however, might be willing to take a short-term loss on the chance of a long-term gain. Fertilization is not recommended because it is not yet known what the results might be and the fear that "shot in the dark" fertilization might make things worse. It appears that the woods owner can not take action to save his property until the researchers discover the cause of the disease and find ways of controlling it.

Losses to date have been serious and appear to be increasing. Even if practical control measures were available today, they would come too late for a growing number of owners. With that in mind there is one positive recommendation for action by woodlot owners that can be made. It is that they should continue and increase the pressure on federal and provincial governments to provide the research effort needed to solve this increasingly serious problem without delay.

The Early, Innovative Days of Adult Education — Part I

by R. Alex Sim

The Adult Education Service at Macdonald College was established in September 1938. This will be an account of the circumstances that led up to the formation of this extension program and some of the highlights of its first nine years when I was its director. It began as an experimental project funded for one year by the Carnegie Corporation of New York, followed by a series of grants from it during my term of office.

The initial request from McGill University was inspired by the Extension Director at McGill, Col. Wilfred Bovey, and the Dean of Agriculture, Dr. W.H. Brittain. They wished to find out how the university could better serve the scattered English-speaking communities of Quebec (the word anglophone had not yet been invented). This was a commendable objective since Sir William Macdonald had built and endowed a magnificent college to serve farm, home, and school. The fact of the 1930s was that McGill and Macdonald were hard up for money, yet they were struggling to maintain an international reputation established by Osler in medicine, Rutherford in physics, and possibly Leacock in economics, though the latter was world famous for his humour rather than for his more serious books on economics. That struggle was confined to the pursuit of the conventional goals of research and academic teaching, an intramural preocupation. Extramural concerns, responsibilities to diffuse knowledge and give leadership on social issues, held a low priority in private institutions that were financed by endowments and contributions from a few interested wealthy people. However, these two able and dynamic officers of the university were restlessly looking for some way to enhance the university's role, and possibly its image, in the community it was intended to serve. Their restlessness was a sign of the times.

It so happened this was a time when adult education was beginning to emerge, paradoxically, as an infant branch of educational enterprise. The Canadian Association for Adult Education (C.A.A.E.) had been established in 1935 bringing together those engaged in regional libraries, workers' education, Canada's already famous Frontier College, and several university extension departments. It was in this latter category that McGill and Macdonald, represented by Brittain and Bovey, wished to create a more dynamic presence. In the East the University of St. Francis Xavier at Antigonish was attracting wide acclaim, especially in the United States, for its work in co-operative education in the poverty stricken fishing and farming villages of eastern Nova Scotia. In the West, the University of Alberta had developed a complex and rich presence in the towns and villages of Alberta, ranging from conventional agricultural extension to boxes of books and drama festivals. It even had its own radio station and had initiated the now illustrious Banff School of Fine Arts.

Besides these inventive and highly publicized initiatives, most universities were offering a more conventional face: night classes, summer schools, and correspondence courses. Most of these offerings were for credit, making few concessions to the special needs and interests of adult students. Most of the courses, being intramural (except for correspondence courses), were inaccessible to most Canadians even if the subject matter was relevent to the needs and concerns of Canadians who were struggling to survive in the depression years. McGill was no different from other universities while Macdonald College maintained a tenuous link with the communities it was intended to serve. That link appeared when a professor was asked to judge at an exhibition, to speak to a group of farmers, or when he published a research report. Actually, the main functions of Macdonald in relation to the agricultural community were discharged through scientific research, in training young farmers in the diploma course, and in sending out young teachers to the rural schools. It should be added that the location of the college on Montreal Island separated it from the scattered anglophone communities in Quebec. The McLennan Travelling Libraries, an endowed facility, were circulated out of the McGill library. McGill also provided a superintendent of Womens' Institutes, a service that was discontinued when the incumbent, Hazel McCain, retired in the early 1940s.

These services to the outside community were not negligible but apparently Bovey and Britain felt they were inadequate. Despite the enormous corporate and personal wealth that was represented by their Board of Governors, it was deemed necessary to seek a small grant from Carnegie, an American foundation that had already helped to set up the C.A.A.E. and regional libraries, as well as to fund projects in Alberta and Antigonish. After the long tenure of Sir Arthur Currie as Principal of McGill, there was a series of short-term appointments to that post. At one time Dr. Brittain served as Acting Principal between appointments. I suspect it was during that incumbancy that the letter to Carnegie was drafted and dispatched.

The original plan, I learned years later, was to employ an established rural sociologist for one year to make a study of the anglophone communities in Quebec and to use that report to seek funding for an extension program. The budget called for a salary of $4,000 plus $1,000 for expenses. Even though the salary was substantial for that period, no rural sociologist could be found. As a consequence, the position was offered to me at $1,800, with the provision of a new Ford V8 at the cost of $750 and other expenses. I had graduated a few weeks earlier from the University of Toronto with an honours B.A. in sociology. I was 27 years old, having been a high school drop-out for several years. As a drop-out I had been active, as an embattled farmer's son, in the farm and co-operative movements in Ontario. Toronto offered no courses in rural sociology, but I had some practical knowledge of farming and life in the rural community. With a background as an activist on campus, and in rural movements, it should have been no

The then principal of Lower Canada College gives a talk on public affairs.

surprise that I began to initiate programs in the first months of my appointment. Since the Carnegie grant was not entirely spent for salary I had over $2,000 left over for programs.

The economic facts of those distant days are interesting. I was asked to established headquarters at Lennoxville. One of the agronomes, Norman Beach, found me an excellent boarding house at $8 a week for room, board, laundry, and mending! I then arranged to locate my office in a small den at the front of the house for an additional $2 a week. This included the use of the family telephone. I then proceeded to contact local clergy, Women's Institute leaders, agronomes, and other community leaders. Invitations to speak soon followed. Between Labour Day and Christmas I spoke 73 times in an area ranging from Scotstown to Cowansville, from Stanstead to Richmond. My subject: the importance and promise of adult education.

This may seem a strange method of conducting a survey. Actually I used the occasion of personal interviews and speaking engagements to ask people about local issues and problems, and, at the same time, offered a panacea: adult education. The research question was what kind of adult education, toward what end? It was a species of action-research which became popular 20 years later. The message I was getting back was, and still is, a familiar one in rural communities: too many organizations, too few people, lack of interest and participation, difficulty recruiting leaders. This informal data gathering was supplemented by extensive information supplied by Professor E.C. Hughes of the Sociology Department at McGill who later published his report *French Canada in Transition* based on a community study of Drummondville. He had also directed a series of student projects and theses of the Eastern Townships to which I had access.

Community Schools

My response to those messages and data bore all the marks of youthful enthusiasm and self-confidence. In October 1938 I organized a School for Leaders offering a variety of courses and experiences. It established a pattern for the community schools which grew and expanded over the years. In fact, the Cowansville School is still operating, as are similar schools in Prince Edward Island which Rudi Dallenbach, then from Knowlton, introduced while an ARDA consultant.

The concept behind the community school was a holistic one designed to combine learning with community enhancement and to invest the whole with an enjoyable experience for body and mind. As a consequence, there was always an assembly meeting at the start for community singing and at the finish for an address on some public issue and for dancing; both country and folk were popular. One had the option of coming only for the course work but seldom was anyone observed coming in after the singing or slipping away before the lecture and dancing. The first school was launched on very short notice yet 98 adults registered, some of whom drove over 40 miles to participate in a new educational experience. The second school was organized for the fall of 1939 using the Lennoxville Public School as a base. Fourteen courses were offered: Agriculture, Child Psychology, Cooperation, Dramatics, Folk Dancing, Group Work, Handicrafts, Home Economics, Library Administration, Public Forums, Public Health, Radio Listening, Recreation, and Religious Education.

With the onset of World War II, and the imposition of gasoline and tire rationing there was pressure to decentralize and multiply the number of schools. Here is the record during the first five years with the enrollment shown in brackets: 1938, 1 school(98); 1939, 2 schools (210); 1940, 4 schools (800); 1941, 7 schools (1000); 1942, 8 schools (1000). There are records of community schools in 15 centres, though all not necessarily meeting in the same year. For instance the first school for Compton County was held in Bury; as new schools opened nearby the Bury school deferred. There were accordingly community schools in the following centres where, in each case, existing school buildings were utilized: Lennoxville, North Hatley, Asbestos, Richmond, Howick, Ormstown, Scotstown, East Angus, Magog, Cowansville, Sawyerville, Stanstead, Lachute, Knowlton, and Bury. In each school there was a local executive recruiting, for the most part, local instructors. They were all financially self-supporting. The Quebec Council of Community Schools was a co-ordinating body which was also self-supporting financially except that the Adult Education Service provided its secretariat. This strategy of self management was imposed by the precarious financial condition of the Ser-

vice, depending, as it did, on grants from Carnegie. It was a strategy that reflected my own taste for local and personal autonomy.

Study Groups

In recommending adult education as a panacea for social and economic problems I was simply voicing the conventional wisdom of the many who were upset by the injustices and hardships that were the lot of so many ordinary people during the depression. Welfare measures were either nonexistent or inadequate. The air was full of proposals for economic and political reform, and even revolution. People were being asked to study the theories that were being noised abroad, and the many farm journals then being published were filled with weighty editorials, articles, and letters to the editor espousing different solutions. The departments and colleges of agriculture had their own solutions to offer: increased efficiency on the individual farmstead. But elsewhere the call was out for group action and the study group was promoted as a two-pronged strategy. It was to be the means of reaching an understanding of the complexities of modern life and the implications of the solutions being offered. It was also to be the means of creating group solidarity and mutual trust between workers and farmers, hitherto famous for their individualism. Behind the proponents of both individualism and group action was the common assumption that people must pull themselves up by their own bootstraps. However, those in favour of group action were urging governmental intervention in the form of parity prices for farmers, pensions for the aged, health insurance for the sick, and adequate welfare for the unemployed. The University of St. Francis Xavier was promoting a study group following a Scandinavian model. They claimed spectacular results, giving a whole new dimension to the word "extension" in university vocabulary. They derided the amiable professor ambling out to the country from his laboratory or ivory tower to lecture on his favourite subject. Father Moses Coady, the director of the extension department, liked to say "give the people spinach before offering them Spinoza."

It should not be surprising, therefore, to recall that I was sent to Nova Scotia for a month before moving out to Lennoxville. Actually, it was not a new experience for me. I had hitchhiked, as a student, the previous summer to Antigonish to become familiar with the work as St. Francis Xavier. It was obvious that I was expected to organize study groups. As a consequence, groups were organized in East Farnham, Gould, Scotstown, North Hatley, and elsewhere. They were supplied with books and pamphlets, but it was impossible to keep in touch with them, or even to know whether or not they were meeting. Winter roads were atrocious. On more occasions than I care to remember, I had to get a farmer out of bed to pull me out of a snow drift with a team of horses. Moreover, there was no cadre of experienced leaders such as were available from the priests in eastern Nova Scotia. In searching for an expedient to skip over snow drifts I turned to radio, first using C.H.L.T. in Sherbrooke with a weekly program called Community Clinic, then in 1939-40 with a small network linking Hull, Montreal, and Sherbrooke.

The Canadian Association of Adult Education was formed at Macdonald College and its 50th anniversary was held last year on the Macdonald-John Abbott campuses. Attending were, l to r, Warren Grapes, President of the Quebec Farmers' Association, Alex Sim, and Steve Gruber, Executive Secretary, QFA.

The idea of using radio as an educational tool had been tried elsewhere. There had been music listening groups in the United Kingdom, but the listeners, while belonging to a music appreciation group, were not required to listen *in* a group. My desire to give the groups adequate support and to be informed of how they were progressing led me to insist on the group listening together while following a prearranged agenda with a procedure for reporting back after each meeting. Dr. Brittain, at this point, insisted that these discussions must have good background material. As a consequence, he enlisted faculty support for the preparation of a series on farm problems.

The Canadian Broadcasting Corporation was interested in listening groups; consequently, it was not difficult to enlist support for the fragile network just referred to for the Community Clinic in 1939-40. Then an eastern Canada network for a program called Farm Radio Forum was initiated in January 1941. The Macdonald College Farm Problem pamphlets were used as discussion guides. Then in the fall of 1941 the National Farm Radio Forum was lunched with the national office at Macdonald College and myself as its first secretary.

In Quebec, the enrollment of groups grew with the program. With radio we were now able to reach into the Chateauguay Valley, Argenteuil, Gatineau, and Pontiac, as well as the Eastern Townships. Besides the casual listeners, there were 100 registered groups in Quebec with about 1,500 members, the numbers tending to fluctuate from year to year until the program was cancelled in the early 1950s. Meanwhile the precursor of the Quebec Farmers' Association had taken shape in the organization of the Quebec Council of Farm Forums. This structure reflected my belief that learning and action should be intertwined and that the learners should assume responsibility for what they are receiving. The fees collected, and grants from the Cooperative Fédérée de Québec and the Quebec Department of Agriculture, were sufficient to carry this branch of the adult education program both before and after the broadcast series was cancelled.

"Leadership Training,"
(Part II, Macdonald Journal, May 1986)

FUN FACT FABLE FICTION

by Ralph H. Estey
Emeritus Professor
Department of Plant Science

Verbs and Animals

Many transitive verbs in slangy use today were derived from some actual or perceived characteristic of an animal; examples include; to wolf; to sponge, to rat; to hound; to weasel, to bug; to buffalo; to chicken out; to clam up; to horse around; to squirrel away, and to bull one's way through.

Chance and Aunts

There was a young girl
of Penzance
Who decided to take just
one chance
She let herself go
In the arms of her beau
Now all of her sisters
are aunts.

Beware!

Marriage resembles a pair of shears, so joined that they can not be separated, often moving in opposite directions, yet always punishing anyone who comes between them. Syney Smith (1771-1845)

How do they do it?

Although they have ceased to multiply, the number of people who are 80 or older constitute the fastest growing population group in Canada.

Hip trouble

A farmer who had recently married a second wife had been complaining of rheumatism in his hips. One day he asked his wife why her goose eggs didn't hatch. She answered, with a bit of sarcasm in her voice, "I presume the gander had rheumatism in his hips."

The Mystical Numeral

All through history "seven" has been a mystical number in fables and in religion. Traditionally, sailors sailed "the seven seas," there were seven wonders of the ancient world, seven wise men of Greece, seven champions of Christendom, seven sleepers of Ephesus, seven pillars of wisdom, and seven ages of man.

Until relatively modern times the "seventh son of a seventh son" was thought to have miraculous healing powers.

The swastika of early orientals and of certain North American Indians is seen by many as being composed of four sevens. The Nazi swastika used sevens in reverse.

Early astronomers looked at the heavens for configurations of seven stars, one of which they named the Pleiades for the seven daughters of Atlas, even though they could see only six stars in the group. They thought there must be seven and that one sister was hiding either from grief or shame. By including the sun and the moon, they found seven "planets." They noted a different phase of the moon every seven days.

The Bible is replete with references to seven, beginning with the story of creation and the period of rest on the seventh day (Genesis 2:2). Noah took elephants, horses, cattle, and most other animals into the Ark "by sevens" and not just one pair of each species (Genesis 7:2). Pharoah dreamed of seven fat cows and seven lean ones and then of seven full ears of corn on one stalk and seven thin ears. His dream was interpreted to mean that Egypt would have seven years of plenty followed by seven years of famine (Genesis 41:17-27). Moses told of the rivers of Egypt being turned into blood for seven days (Exodus 7:20-25).

Many people see some mystical significance in the seven stanzas of the Lord's Prayer and in the seven last words of Christ on the cross. Saint John in his Revelation refers to seven churches in Asia and the peace that would come from seven spirits (Rev. 1:4). He also wrote about seven stars and seven golden candlesticks (Rev. 2:1), a lamb with seven horns and seven eyes (Rev. 5:6), seven angels and seven trumpets (Rev. 8:6), and a beast with seven heads (Rev. 17:3).

Many Jews and the followers of Mohammed believe in seven heavens; consequently, "the seventh heaven" and "a seventh veil" are phrases encountered in the literature of many nations. Two festivals of the Hebrews, the Passover and the Feast of Tabernacles each last seven days and between them there is an interval of seven weeks.

The sacraments of the Roman Catholic Church are seven in number and so are the orders of the ministry. The early Christian fathers looked upon certain sins as being fundamentally worse than others and these became known as the "seven deadly sins."

Children know the fables of the "Seven League Boots" and of the seven years of bad luck if they break a mirror, and they learn of the seven hills of Rome soon after they learn to spell the seven days of the week.

Why the number seven had such mystical appeal for our ancestors remains a mystery. In the Middle Ages, and perhaps earlier, it was a symbol of completeness composed as it is of the perfect numbers three and four representable in space by the triangle and the square.

You, the reader, may recall other examples of the use of seven, but in trying to think of them don't get yourself "at sixes and sevens."

Deice with Fertilizer

The fertilizer, urea, can be used to prevent the formation of ice or to soften ice that has already formed. It is effective down to about −11°C. does not corrode most metals and stimulates the growth of grass along roadways. Pellets of urea have been used to deice the runways of Canadian airports for more than 10 years.

What a Woman!

Theresa Vaughan confessed in a police court in Sheffield, England, December 19, 1922, that she had married 61 different men before she was 25 years of age. Perhaps she was trying to emulate the record of Berber Queen Kahena of Algeria who is reputed to have had a "harem" of 400 men.

Good conscience

One of the good features about my conscience is that it never bothers me until after I've had my fun.

Decreasing value of money

Another thing that money can't buy is what it did five years ago.

Comments on Second Annual Career Day

* * * *

To Be Congratulated

I was very pleased as a former student to come back to Macdonald College and participate in Career Day.

It was interesting to find out that it was arranged by the students themselves. Both Suzan Smith and Anne Delmas and their groups are to be congratulated. It was well organized, and I found the students enthusiastic and polite and interested in their chosen careers.

Career Day works both ways in giving students the opportunity to talk to potential employers and for the industry to realize the quality and abilities of students at Macdonald.

Career Day should be continued.

Norman S. Logan
Director, Quality Assurance Department
Steinberg Inc.

* * * *

Tremendous Job

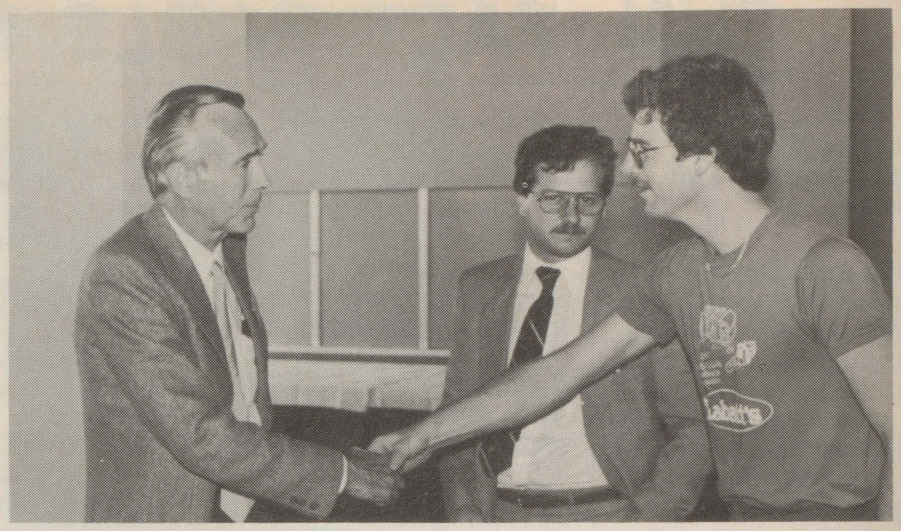
The students did a tremendous job, and I certainly think it should be a yearly event. The comments that I heard from industry were very positive. Several particiants mentioned that they were impressed by the wine and cheese reception following the event. This opportunity for mixing by all the participants is a skill not often used by students and should be encouraged. Career Day gives business people an opportunity to come to Macdonald to meet our students, and this is especially important today when the job market is so tight.

Laurence Baker
Department of Agricultural Economics

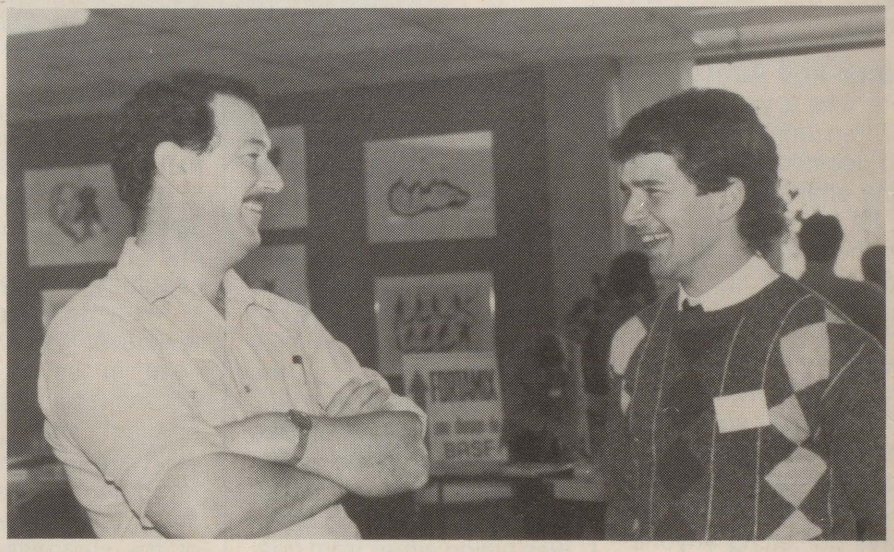
* * * *

Wide Range of Working Possibilities

I hope that my participation as an Agropur Cooperative representative gave the students the chance to enlarge their knowledge of the agro-food business. Career Day is a great way to make students realize that there is a wide range of working pos-



Norman Logan, left, of Steinberg Inc. greets student Peter Enright while chatting with Pellemon's Omer Lemay.



Laurie Baker of the Department of Agricultural Economics obviously appreciates the comments of Dip graduate Michel Viau of Alfa-Laval.

Richard Walsh, right, of Agropur answered many questions on his company's operations. In the background Anne Delmas talks with Ogilvie Mills's Peter Cauchy and Graham Worden.

Jean Paul Brenn, 1, explains some information on BASF Fortamix to Suzan Smith while his colleague Janet Kisilenko looks on.

Surrounded by students Betty Statford-Smith of the School of Dietetics and Human Nutrition catches up on the latest at Blue Water Seafoods with François Vervroegen.

Anne Delmas, r, was very pleased to welcome Helen McNair of Dempsters to the second annual Career Day.

sibilities, maybe not all exactly in the field that they have in mind. It may guide them to reroute their studies and courses according to the needs of the different enterprises. Most students think that what they are undertaking is exactly what they will get in the working field. Not necessarily so! Moreover Career Day may make them realize that the first door at which they may make an application is not necessarily the only door. There are a lot of enterprises in the agricultural field that are waiting for them but with the present unemployment situation students have to be patient and persevering.

I tried to point out to students that they have to "market" themselves because rarely will an enterprise approach them with a job opportunity. I hope that students are not dreaming too high but are facing the realities of the '80s, and I think that Career Day is a great way of showing students what is going on today.

A suggestion I would make would be to give the necessary free course time for all students to participate as I noticed that in some cases students didn't have enough time to get acquainted with all the people available.

Richard Walsh
Agropur Cooperative Advisor
Granby

* * * *

Good Liaison

It is an excellent opportunity for a good liaison to be established between Macdonald and the community and should be encouraged, particularly with jobs being scarce. Career Day gives the business community an opportunity to become even more aware of what expertise we send our students out with.

Betty Stafford-Smith
School of Dietetics and
Human Nutrition

* * * *

Can't Learn Everything

Students have to learn that they can't learn about all aspects of all the different food industries in school. They should not be afraid to apply for a job with a good company just because they did not take a course in that company's speciality. Enthusiasm and the ability to apply knowledge to a new situation are the important things.

Helen McNair
Quality Control, Dempsters

The Advantages of a Position In Sales

The students' questions were good. With Shur-Gain, as well as with many companies in the agribusiness sector, most openings are in sales and students' attitude toward sales' jobs is lukewarm. There is an obvious lack of understanding of what sales is all about in 1986, and Career Day is an excellent opportunity for the students to know what is going on in the business world. Sales positions are there for those who like challenges, are determined, and have the ability to communicate with people. Indeed sales is not for everyone: may I stress, however, that many sales jobs lead to very good management positions.

Students must be willing to learn and to be flexible — needless to say the results will come in time along with a high degree of satisfaction. There is no magic behind the word "success."

I don't think there were as many students at this year's Career Day compared to last year. There were more people from first and second year and not so many from the agricultural programs. Why? Were they well informed? It could be more successful if it were organized later in October when the students are more in the mood for job hunting. I thought staff participation was great.

I would like to see the curriculum at Macdonald give the students the opportunity to learn more about the business world — marketing courses, communications — whatever could help the students to understand what is going on in the agribusiness sector.

Marc Prefontaine, agr.
Shur-Gain Sales Supervisor
Eastern Ontario

* * * *

A Job Well Done

It was great to witness so much participation in Career Day, both from the various employers' groups and from the students.

Career Day provided an excellent opportunity for our students to "sell" themselves, a definite asset in a world where job opportunities are becoming scarce. It also provided an opportunity for our students to learn about the "real" world, and to have contact with some of the managers who make it work. In my opinion, this made it a most useful "LAB" period, where knowledge, which could not be taught in a classroom situation, was acquired by everyone who participated.

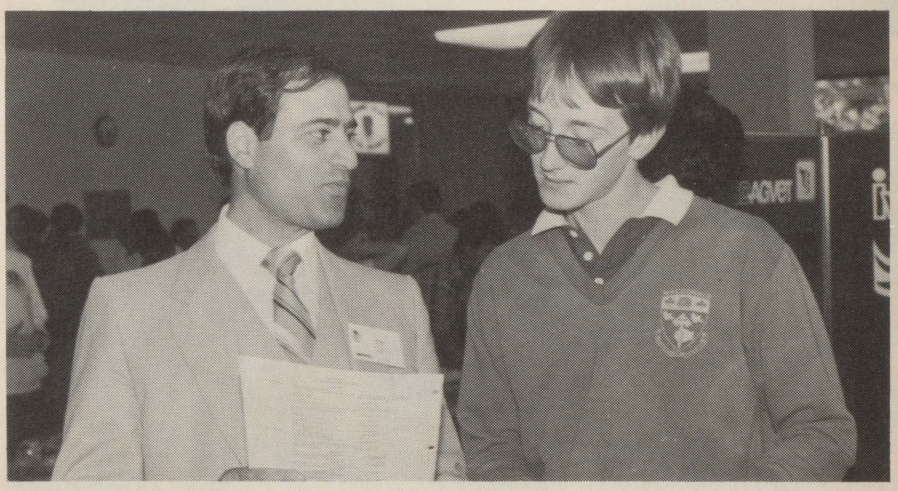
Because of the importance which Macdonald College puts on building closer links with agribusiness, Career Day met all of my expectations.

A big "THANK YOU" to the employers (many of them were Mac grads), the staff members who took the opportunity to renew old acquaintances, the students who participated, and especially the organizers, for a job very well done.

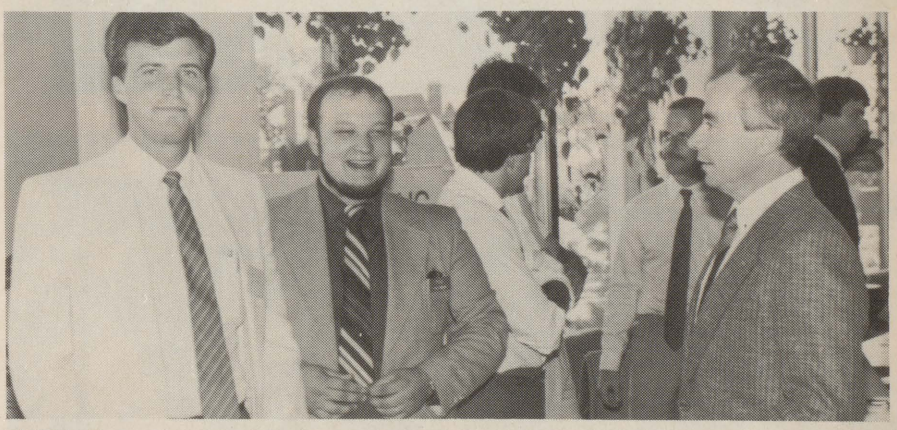
Macdonald College was certainly well represented!

Marcel J. Couture,
Director
Macdonald Extension Service

Marcel Couture, of the Diploma Program and Extension Services, visited with Shur-Gain's Marc Préfontaine and Serge Lefebvre.



Nutrite's Ab Badra answers questions from student Dale Burns.



TUCO's Yves Bérubé and Richard Hart discuss Career Day with Professor Paul Lague of the Department of Animal Science.

A FORCE FOR THE FUTURE

Edited by
M. Elizabeth Jennaway-Eaman
Faculty of Education

The following article is based on excerpts from the Canadian Home Economics Association position paper Home Economics/Family Studies Education in Canadian Schools which was released Spring 1985.

Across Canada there is currently much public discussion and debate over policies and program priorities for education in the future. As our society adjusts to a new post-industrial, high technology era, there is concern over limited financial resources and high unemployment. The effects of this post-industrial, high technology era are being felt in the changing nature and instability of our work and interpersonal relationships. With fundamental changes occurring in society, education policy makers and educators are questioning the kind of knowledge which is essential.

Home economics/family studies makes a unique contribution to the education of young people in our society. It focuses on the nature and challenges of our daily lives in relationship to other people, social systems, and material resources. It is a *practical* science, looking at daily human problems of "what should be done about . . ." securing housing, acquiring appropriate clothing, caring for children, etc. Unique to its considerations are the substantive areas of human relationships and development, resource management, consumerism, foods and nutrition, clothing and textiles, housing and aesthetics.

Because it focuses on the experiences in the daily lives of people, home economics offers to students an alternate form of knowledge, which is immediate and often concrete and draws the learner into the process of actually developing solutions and knowledge. Through an emphasis on awareness of the self in the learning process, students develop basic skills in learning how to learn. The process is interpretive and communicative. The goal is personal, interpersonal and social development.

M. Elizabeth Jennaway-Eaman

Home economics has an educative and preventative mission. It aspires to increase the resourcefulness of people and help them to live satisfying and quality lives. Resourcefulness is developed through helping people view problems from various perspectives. People are encouraged to recognize alternate resources and to create resources in the solution of daily problems. This resourcefulness is essential in developing self-reliant attitudes and abilities. Home economics/family studies provides young people the opportunity to consider daily living problems, frequently prior to their actual encounter, and thus develops their responsibility as individuals in society. The skills and knowledge developed in home economics/family studies are useful to students not only in their personal and family lives, but also in securing and holding employment in business, industry, and the professions.

Home economics/family studies makes a unique and central contribution to education in our post-industrial and high technology era. The emerging emphasis on science and technology in education demands an equal emphasis on development of personal and social skills. John Naisbitt speaks of the high tech/high touch response which education must make. "As computers begin to take over some of the basics of education, schools will more and more be called upon to take responsibility for teaching values and motivation, if not religion" (Naisbitt, 1982, p.47).

Paul Hawken emphasizes the general and flexible intelligence which education should develop. "The informative economy requires more intelligence from everyone — management, labour, consumers, goverment" (Hawken, 1983). The technological changes occurring in our society and their impact on our work lives and personal and social relationships provide specific indication of the increasing need to provide the educational opportunity for young people to understand and direct their daily lives.

Education should be dedicated equally to promoting personal and social knowledge development and abstract and technical knowledge development. Home economics/family studies, in helping people make decisions about daily living through understanding our nature as social beings and our relationship to the material and social environment, makes a paramount contribution to human sciences education.

In Quebec home economics/family studies is currently part of education for both males and females at Secondary II level, emphasizing personal decision making, management skills, and personal and family development.

Many of us question whether a 100-hour course at age 13 - 14 is sufficient preparation for today's complex society.

Current research by B. Stafford-Smith (1984) indicates a need for more consumer education at the CEGEP level. Can we afford not to educate our young consumers more for survival in tomorrow's world?

References

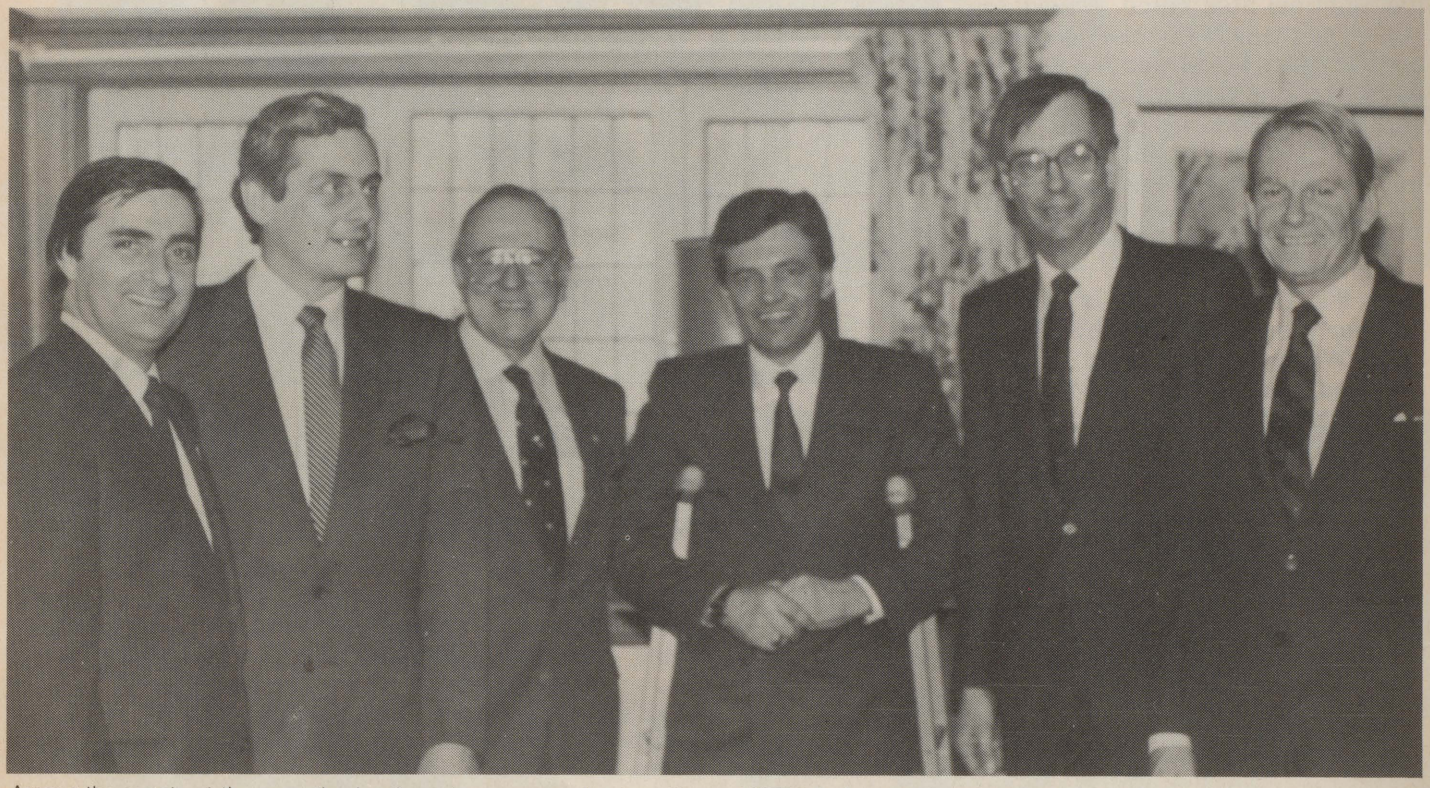
Hawken, Paul (1983). **The next economy.** Toronto: Random House.

Naisbitt J. (1982). **Megatrends.** New York: Warner.

Stafford-Smith, B. (1984). Home Economics Education in Quebec — Commitment and Conjective: C.H.E.J., 34,3.

newsmakers

on campus



Among the guests at the reception-luncheon to announce the new Shaver-NSERC Industrial Research Chair in Poultry Biotechnology were, l to r, Pierre Cadieux, MP for Vaudreuil-Soulanges, Dr. Claude Lajeunesse, Director of Target Research at the Natural Sciences and Engineering Research Council (NSERC), Dr. Donald McQueen Shaver, founder of the Shaver Poultry Breeding Farms, Michel Pagé, Quebec Minister of Agriculture, Fisheries, and Food, Dr. Roger Buckland, Vice Principal (Macdonald College) and Dean of the Faculty of Agriculture, and Clifford Lincoln, Quebec Minister of the Environment and MNA for Nelligan.

DR. URS KÜHNLEIN APPOINTED TO NEW SHAVER-NSERC INDUSTRIAL RESEARCH CHAIR IN POULTRY BIOTECHNOLOGY

It is a pleasure to introduce Dr. Urs Kühnlein who was appointed recently to a new research chair in poultry biotechnology in the Department of Animal Science.

Dr. Kühnlein, an Associate Professor, received his PhD in 1970 from the Department of Molecular Biology, University of Geneva, Switzerland, and, subsequently, was a Postdoctoral Fellow at Stanford Medical School in California. Since that time he has done research at the University of California, Berkeley, the B.C. Cancer Research Centre, and the University of British Columbia. For the past year, Dr. Kühnlein was a Senior Scientist at the Chalk River Nuclear Laboratories, Chalk

Newly appointed to the Shaver-NSERC Chair Drs Urs Kühnlein discusses his research with Diana Bishop of CBC television's Newswatch. Dr. Kühnlein's day was filled with interviews for radio, television, newspapers, and magazines — he even had a telephone call for an interview from his homeland, Switzerland.

Dr. R.S. Gowe, Director, Animal Research Centre, Ottawa, Dr. Shaver, Dr. Bruce Downey, Chairman of the Department of Animal Science, and Dr. Buckland. Dr. Shaver said at the luncheon, "We are very pleased to be a partner in this venture. To be competitive, Canadian industry must get more involved in helping fund major research projects. By encouraging work like this, we expect that everyone — business, university, and consumers alike — will benefit."

A ski accident in December did not prevent Quebec Minister of Agriculture Michel Pagé from attending the reception along with his new Press Attaché Ann Louise Carson, BSc (Agr) '81, both being congratulated by Dr. Buckland.

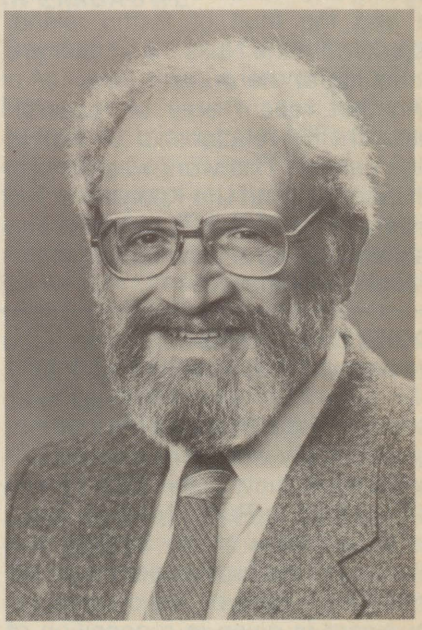
River, Ontario. Professor Kühnlein has extensive experience in the study of molecular defects underlying cancer-prone genetic diseases and DNA repair.

The new industrial chair, which is supported jointly by the Natural Sciences and Engineering Research Council (NSERC) and Shaver Poultry Breeding Farms, Ltd., was created in an effort to initiate an innovative research program in poultry which could develop and exploit new techniques in this rapidly expanding field called biotechnology. The possibility of introducing cloned genes into the germline of birds and animals has created a new frontier in basic and applied biological science. An obvious application is the improvement of livestock by manipulating genes which determine economically important traits. Since there is a lack of knowledge as to which genes determine what traits, initial research will be geared to the identification of genes of interest. Simultaneously, techniques for the transfer of cloned genes into birds must be developed since the methods already used in some mammalian systems may not be applicable.

With Dr. Kühnlein's arrival, an exciting new dimension has been added to our research effort in Animal Science. We trust that this will lay the foundation for future expansion in the field of biotechnology.

DIRECTOR OF McGILL INTERNATIONAL

A long-time Faculty of Agriculture staff member has recently been appointed to a McGill position having responsibilities for the entire university. Professor Eugene Donefer is now Director of McGill International, the office which helps to develop and coordinate the university's involvement in international projects. Professor Donefer brings to his new job his personal involvement over an 18-year period with international agriculture projects primarily in the Caribbean and more recently in China. Although he will be located on the Montreal campus, Professor Donefer will maintain an office at Macdonald College and is particularly interested in increasing the Faculty of Agriculture's international involvement — in many anticipated cases in conjunction with other McGill faculties. Professor Donefer also feels that his new position will enable him to help find financial support for the proposed MSc degree in International Agriculture to be located at Macdonald College.



NEW DIRECTOR APPOINTED

The Macdonald community welcomes a dynamic couple to the college clan: Drs. Urs and Harriet Kühnlein. Dr. Urs Kühnlein is occupying the new Shaver-NSERC Industrial Research Chair in Poultry Biotechnology in the Department of Animal Science (see page 38), and his wife Harriet became the new Director of the School of Dietetics and Human Nutrition, effective January 1, 1986. Dr. Harriet Kühnlein comes to Macdonald from the University of British Columbia where she was Associate Professor in the School of Family and Nutritional Sciences.

Born in Sadsburyville, Pennsylvania, Harriet Kühnlein received her BS in '61 in the Department of Foods and Nutrition, Pennsylvania State University, her MS in '69 at Oregon State University, and her PhD in '76 at the University of California, Berkeley. She held various positions in the United States as well as in Cali, Columbia, and the University of Geneva in Switzerland before coming to Canada and the University of British Columbia in 1976.

Dr. Kühnlein's research has been in the broad area of human nutrition, with particular emphasis on indigenous foods, their composition and patterns of use and resulting nutritional status of native people in North America. She has worked with the Arizona Hopi, the Nitinaht, and Nuxalk of British Columbia and the Inuit of Baffin Island. Projects with the Nuxalk and Inuit are continuing at the present time.

Another recent area of research was with the relationship of diet to colon cancer. This work was done in collaboration with Urs Kühnlein at the University of British Columbia and resulted in several publications in the scientific literature.

Dr. Harriet Kühnlein has approximately 30 published papers to her credit and is working on a book concerning the nutritional values of edible wild plants in North America. She is a member of the Amercian and Canadian Dietetics Associations, the Canadian Society for Nutritional Sciences, the American Institute of Nutrition, the Committee for Nutritional Anthropology, a board member for the Society for Ethnobiology, the Society for Nutrition Education, and the West Coast Network for Nutrition and Anthropology for which she served as president 1979-80.

Dr. Kühnlein is pleased to be the new Director of the School of Dietetics and Human Nutrition and is looking forward to building the faculty and graduate student research effort in human nutrition.

Harriet, her husband, and their son, Peter, have recently bought a house close to the college in Baie d'Urfé.

SOCIETY FELLOWS

Two people familiar to the Macdonald College community were among the 11 members of the American Phytopathological Society who were elected Fellows of the Society at the 1985 Annual Meeting held in Reno, Nevada. Election as a Fellow of the Society is a reflection of the high esteem in which a member is held by his colleagues. The award is given in recognition of outstanding contributions in extension, research, teaching, or other activity related to the science of plant pathology, to the profession, or to the Society. Originally from Montreal, Que., **RICHARD I. HAMILTON** joined the Department of Plant Pathology at Macdonald in 1967 as the first plant virologist at McGill. In 1972 he joined the Virus Chemistry and Physiology Section of the Vancouver Research Station of Agriculture Canada. His research has focused on the transmission of viruses by seed and pollen and the interaction of unrelated viruses and virus strains in mixed infections. He is currently president of the Canadian Phytopathological Society.

From Manitoba, **WALDEMAR E. SACKSTON,** received his MSc (Agr) here in 1940. He came to Macdonald in 1960 and became professor of plant pathology and chairman of the Department of Plant Pathology. Prior to that he had been with the Plant Pathology Laboratory in Winnipeg, had acted as special consultant on sunflower diseases in Chile, and from 1956 to 1957 he advised the government of Uruguay on disease of sunflowers. From 1972 to 1977 he was on leave from Macdonald to organize the National Research Center for Oilseed Crops at Cordoba, Spain. He has also worked in the USSR, the United Kingdom, France, and New Zealand.

Dr. Sackston is a pioneer in sunflower disease research and has become an international authority on sunflower diseases. In 1982 he received the V.S. Pustovoit Award of the International Sunflower Association and was elected a Fellow of the Canadian Phytopathological Society, and in 1983 he was awarded the Dr. and Mrs. D.L. Bailey Award of the Canadian Phytopathological Society.

Professor Sackston continues to do research and work with his graduate students on a post-retirement appointment in the Department of Plant Science.

DR. ERIC NORRIS, of the Department of Agricultural Engineering, is Chairman of the North Atlantic Region, American Society of Agricultural Engineers for 1985-86.

DR. V.R. VICKERY, of the Department of Entomology, is President of the Orthopterist's Society for a three-year term. At the annual meeting of the Entomological Society of Canada held in Ottawa in September, Dr. Vickery was made a Fellow of the Society.

VISITORS TO ENTOMOLOGY

A warm welcome was given to grads who visited the Department of Entomology over the past few months. **KAREN TOOHEY,** MSc (Agr) '78, with her husband Mark and two daughters. Mark worked in the Department with Dr. Morrison one summer. **RAYMOND MANUAL,** BSc, MSc, and PhD '82, was here from Trinidad, and **ALASTER DEMPSTER,** BSc (Agr) '80, MSc (Agr) '84, was visiting from the University of California, Riverside, where he is working on his PhD.

off campus

INTERNATIONAL NEWS

ANNA WHITTON, Class of '75, tells us of the fantastic time she had in late October when she attended her first international, wedding. **PIERRE LØNDORF,** BSc (Agr) '78, and Uschi Michel where married in Wholen, Switzerland. The wedding was marvelous as it was a combination of Swiss, Danish, and, of course, Canadian customs. Pierre is now working in Switzerland as is **MICHAEL JOHNSTON-STEWART** (Scotty), BSc (Agr) '73, — he is with the International Air Transport Association (IATA) in Geneva — and Anna had a chance to visit with him and his family. She also gives us news of two Faculty of Education grads, Wayne and Margaret (Stewart) Melford who are living in Ettenheim-Munchweier, Germany, and teaching school in Lars.

VISIT TO HUNGARY

During a one-week visit to Hungary last fall, **DR. E. DONEFER,** of the Department of Animal Science and newly appointed Director of McGill International, visited agricultural teaching and research facilities in the Budapest area. The purpose of the trip was to determine possible McGill involvement in the World Bank-financed Hungarian Livestock Development Project. Tour arrangements were made by the Canadian Embassy in Budapest under the able guidance of **GEORGE WRIGHT,** Commercial Counsellor and Consul and Mac graduate '72 in Agricultural Economics. On a stop-over in Rome and visit to FAO headquarters, Dr. Donefer met with another Mac alumni, **DR. D.E. FAULKNER,** who is the current editor of the FAO journal, World Animal Review. After completing the Mac Diploma Program in '32, Dr. Faulkner went on to Guelph to obtain his DVM and continued on to a distinguished career in the British Colonial Service as a Veterinary Officer in the Near East, Africa, and the Caribbean. His current FAO assignment is 10 years post-retirement.

A LONG AND HAPPY RETIREMENT

WALKER RILEY, former professor in the Department of Agronomy and a former editor of the *Macdonald Journal,* has retired from his position as a soils and crops specialist at the Ontario Ministry of Agriculture and Food's Nipissing office where he has been for the past 10 years. He is now enjoying his farm in Milford Bay, and we join his many friends in wishing him a most happy retirement.

CANADIAN HOME ECONOMICS ASSOCIATION AWARDS FOR 1985

The Silver Jubilee Scholarship was awarded to **ANNABELLE MUNKITTRICK,** who received her B.Ed in Home Economics in 1970. Annabelle, who is currently enrolled in the PhD program at the University of Illinois in home economics education, was a joint winner with Nancy Copeland of Winnipeg, Manitoba.

Before undertaking PhD studies, she was a home economics department head at H.S. Billings High School in Chateauguay, Que. with considerable experience as a home economics teacher. Annabelle is interested in a university professor position which would promote the profession of home economics in Canada, particularly the high school program. Her research is focussed on the home economics curricula, based on sound learning and curriculum theory, as well as recruiting, instructing, and supervising home economics teachers who understand and can implement revised curricula. Annabelle is also interested in designing new computer assisted instruction programs for home economics education and in general promoting the special goals of home economics educators.

Annabelle Munkittrick was unable to attend the awards presentation dinner, held in Vancouver during the annual CHEA conference, but her letter of thanks states: "Being a doctoral student at the University of Illinois is a great opportunity for me and receiving this scholarship has enabled me to further my educational goals and objectives. My plans are to write my doctoral dissertation in the area of critical thinking in Home Economics. I feel honoured to have been selected for this award. It is indeed a privilege to be part of the Canadian Home Economics Association which sees the importance of continuing education and supports students in their quest for higher education."

The 1985 CHEA Honour Award was presented to **WINNIFRED J. BRACHER,** BSc (HEc) '42, newly retired Assistant Professor, School of Family and Nutritional Sciences, the University of British Columbia.

Winnifred Bracher taught in Sherbrooke, Que., for three years before going West to teach high school for a further six years in Victoria and Vancouver, B.C. In 1950 she gained her M.A. from Columbia University (Teacher's College) and the following year commenced her long association with UBC. Over the following 34 years she was instructor, assistant professor, and acting director of the School of Home Economics, now the School of Family and Nutritional Sciences. Her area of expertise has always been clothing and textiles, with a special interest in the history of costume.

In her honour a permanent display of textiles is to be mounted at UBC, called the Winnifred Bracher Collection, as a record of her contribution to the home economics profession, and as a symbol of the high respect and esteem in which she is held by all her colleagues at UBC.

Dr. JOSEPH MACNEIL ON A SPECIAL PROJECT IN ZIMBABWE

Developing a Food Science program in Agriculture at the University of Zimbabwe must qualify as a legitimate excuse for missing last fall's Reunion of the Class of '55 and "frankly, I don't feel old enough to attend any 30-year anniversary!" **JOE MACNEIL** wrote in a recent letter telling us something of his work in Zimbabwe. We are pleased to share with you excerpts from it and other relevant items to bring you up-to-date on an active 30 years spent by one "Cape Bretoner."

Joe MacNeil obtained his MSc (Poultry Marketing) '58 and his PhD (Food Science) in '61 from Michigan State University in East Lansing. The next steps in his career included being an assistant professor in poultry science at the University of Connecticut, a senior research associate for Lever Bros in New Jersey, and from there to the Pennsylvania State University where he is a professor, Food Science, where he directs the food

research program on all phases of poultry product technology as well as being the director of the University Sensory Evaluation program. Actually, he would be doing the above if he were not on the second year of an assignment for Penn State at the University of Zimbabwe.

Joe MacNeil has had previous international experience, including being a technical coordinator for a Peace Corp Training Project in India, being a Fulbright Scholar at Ankara University in Turkey, and providing technical assistance to the Postgraduate Institute of Agriculture at the University of Peradeniya, Sri Lanka.

"As you can see," Joe MacNeil writes, "my interest in Food Science has definitely taken an international bent. This happens to fit in with my university's commitments to international development and, of course, my particular area of interest is the more efficient utilization of basic agricultural materials.

"My current assignment here in Zimbabwe is to develop a Food Science program in Agriculture at the University. The assignment has recently been enlarged to consider Nutrition and Home Economics. I am now part of a very large committee with members from Agriculture, Science, Medicine, Veterinary Science, and Education. I'm sure you can see the task will not be easy.

"This is a very interesting and beautiful country and it enjoys a unique position in Africa. A major plank in government policy 'is growth with equality.' Zimbabwe, while still very much a developing country, has made great strides in its five years of independence. In seeking self-sufficiency, Zimbabwe leadership wants to double the number of students enrolled in agriculture. A critical problem is the shortage of competent faculty. For example, we do not have even one Zimbabwean food scientist at the university. The present program is carried by temporary appointments and visiting faculty.

"I feel very fortunate in that for one reason or another I was exposed to the type of education that made involvement in international development a natural. Both NSAC and Mac provided the broad base of agricultural training that I could build on later with my post-graduate studies at Michigan State University. Working in the N.S. Department of Agriculture in extension, then later with Maritime Cooperative Services, I believe was another factor in my professional development. Job descriptions were hard to come by in those days. First you had to identify the problem, then you had to solve it. Looking back now — a clear case of swim or sink.

A family get together in Nova Scotia, includes five children, a son-in-law, daughter-in-law, and mother-in-law. "That lovely little grey-haired lady sitting between my wife and me is my mother-in-law and is the former Isabel Cavanaugh who graduated from Mac back around 1918," wrote Joe MacNeil.

Professor Joe MacNeil, back, 4th from left, with colleagues from the University of Zimbabwe, Michigan State and Penn State Universities on the occasion of the visit to the university farm by President of the Republic of Zimbabwe, His Excellency C.S. Banana, 3rd from left, front.

"... it certainly would have been fun to visit with the Class of '55. I haven't been in contact with any classmates for quite some time. My travelling keeps me busy but it is well known in our circle of friends that old Joe goes to Nova Scotia every summer, no matter what else needs to be done. This is how the batteries get charged up every year."

BRUCE M. TRENHOLM, BSc (Agr) '47, was inducted into the Atlantic Agricultural Hall of Fame on October 11, 1985. We quote, in part, from the citation: "Bruce Trenholm is no stranger to agriculture. He has been involved in the industry since youth and his influence and experience through the years have been substantial. Upon graduation from Macdonald College he served as the Agricultural Representative in Yarmouth and then taught Animal Husbandry at NSAC for three years. In 1952 he took over the family farm going on to establish the well known Brulo herd. For several years the Brulo herd had the highest BCA for over-20 herds in Nova Scotia. In 1984 he was awarded the Master Breeder Shield from the Holstein-Friesian Association of Canada which is the highest honour that can be bestowed upon a Holstein breeder. In 1971 the Brulo herd was dispersed and Bruce went to Barbados where he worked on a Canadian International

Development Dairy project for two years. In 1974 he again joined the N.S. Department of Agriculture and Marketing serving as the Agricultural Representative in Pictou, retiring from that position in 1984. His contributions to agriculture have been many and varied and are worthy of recognition in the Atlantic Agricultural Hall of Fame."

Bruce Trenholm and his wife Estelle have "retired" to Mahone Bay in Nova Scotia but haven't found out what retirement is all about as yet. The reason is that both are deeply involved in the Atlantic '86 Holstein Canada National Convention which will be held in Moncton, N.B. in July. Bruce is coordinator and Estelle is secretary for the event.

DR. DAVID CROWE, BSc (Agr) '48, has been appointed assistant director of the Kentville Research Station. He was program leader and section head for tree fruits and has been with Agriculture Canada since 1961.

DR. KEITH MURRAY, BSc (Agr) '48, MSc (Agr) '50, PhD '57, has been appointed the first full time president of the National Institute of Nutrition. The Institute, formed last year, is committed to focusing greater attention on nutritional matters in Canada.

BOB ROSS, BSc (Agr) '49, MSc (Agr) '53, Assistant Director at Kentville Research Station and Head of the Crop Protection Section, retired at the end of March 1985 to bring to a close a career spanning 38 years at the station. A native of Oxford, N.S., Bob received his PhD degree on the activity of organic fungicides from the University of Western Ontario. His research focused on tree fruit diseases and their control, especially apple and pear scab. In cooperation with the late Keith Stewart, he achieved a major breakthrough on the movement of mercury fungicide in plants. During the growing season, he worked closely with his colleagues and with fruit growers to improve control methods against plant diseases and to implement integrated pest management programs. Bob is past president of the Nova Scotia Institute of Agrologists and of the Canadian Phytopathological Society. He and his wife Doris plan to retire in Wolfville. Retirement plans include travel, golf, sailing, further study at Acadia University, and possibly consulting work.

(Excerpts from Agriculture Canada Research Branch *Tableau,* August 1985)

DONALD C. BISHOP, BSc (Agr) '50 has retired from his position as coordinator of administration and superintendent of exhibitions with the N.S. Department of Agriculture and Marketing. However, he will continue his association with exhibitions as secretary-manager of the Exhibition Association of Nova Scotia.

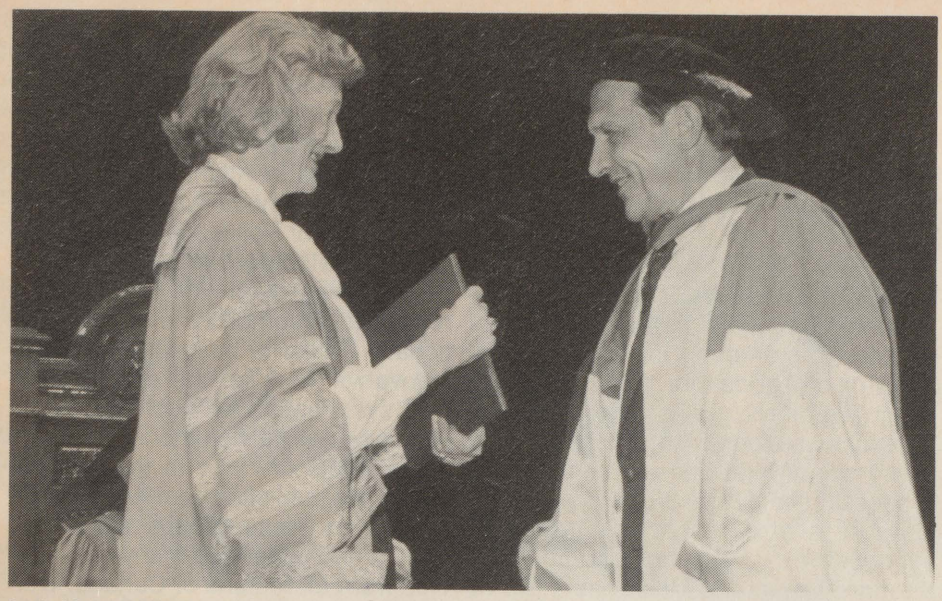
RUSSELL DUCKWORTH, BSc (Agr) '51, has been appointed executive director of marketing for the Ontario Ministry of Agriculture and Food. As executive director, Russell is responsible for a division which includes three branches: market development, food processing, and farm product marketing. He is also responsible for the supervision of 24 commodity boards through the Ontario Milk Commission and Farm Product Marketing Board. In announcing this appointment, George Collins, Assistant Deputy Minister, said, "This division provides leadership to the agricultural and food industry in orderly marketing, domestic promotion, export development, value-added processing, and trade issues. Deputy Minister Clay Switzer said, "Russell Duckworth brings many years of experience in the production and marketing of agricultaral commodities to the position of executive director of marketing. Russell is a former vice-president of operations, retail sales and farm services for the United Co-operatives of Ontario. His marketing experience includes leadership of international sales of seed corn, beef calves, and dairy cattle.

WHAT'S HAPPENING?

Where are you? What are you doing? What have you heard about your fellow grads? New jobs, promotions, awards, retirements. From a first job, through all the steps up the ladder, to retirement, and post-retirement — keep us informed on what's happening so we can pass the news along on these pages to your fellow grads. Any news you would like to share with us would be welcome. We delight in hearing from you and about you. Send information to Hazel M. Clarke, Editor, Box 284, Macdonald Journal, Macdonald College, Que. H9X 1C0

ROLLIE MULVEY, BSc (Agr) '51, who retired in 1979 from the Biosystematics Research Institute, became a Fellow of the Society of Nematologists at the Society's annual meeting held in Atlantic City, N.J. in June. This honour was granted in recognition of Rollie's significant role in the development of nematology in Canada, as well as his notable research accomplishments. Internationally, Rollie is best known for his innovative work on the cytogenetics and systematics of such important plant pests as the nematodes that form either knots or cysts in the roots of plants. He published over 44 research papers on these groups alone and named and described many new species from all regions of Canada. During his 28-year career in research, Rollie was a leading authority on nematodes in Canada, and through his extensive surveys, a major contributor to the Canadian national collections of insects, arachnids, and nematodes. His distinguished career extended beyond retirement with a leading publication on the cyst-forming genera and species of the Heteroderidae of the western hemisphere. (Excerpts from Ag Canada *Tableau* June-July, 1985)

PETRAS LUKOSEVICIUS, MSc (Agr) '56, PhD '62, Program Specialist for the Quebec region, retired after 28 years with Agriculture Canada. Petras was born in Lithuania. In 1948 he got a Diplomlandwirt (BSA) from the University of Bonn, West Germany, and shortly afterward he came to Canada. Immediately after receiving his PhD he went to l'Assomption where he conducted genetic research on flue-cured and cigar tobacco. Petras developed the cigar tobacco cultivar l'Assomption 201 and initiated a national program comprising more than 300 panel members throughout Canada and France to evaluate cigar tobacco. Later he was appointed superintendent at l'Assomption, a position he held for more than 10 years before becoming a special adviser on crops in the Program Coordination Directorate in Ottawa. Since 1982, when he took up his last post, Petras has made an enormous contribution to the development of the Quebec Region. On retirement he and his wife Irena plan to travel in Europe and elsewhere. (Excerpts, from Ag Canada's *Tableau* June-July 1985)



Lady Violet Aitken awarding an honorary degree to R. Edward Bailey.

R. EDWARD BAILEY, MSc (Agr) '68, was awarded an honorary Doctor of Science degree by the University of New Brunswick at its Bicentennial Fall Convocation on October 20, 1985. He received the degree from Lady Violet Aitken, Chancellor of the University. Ed Bailey, who is Director of Reforestation and Silviculture with the Nova Scotia Department of Lands and Forests graduated from UNB in 1964. To quote briefly from the citation, "Mr. Bailey's great contribution has been his ability to advance the application of forest science to real operational problems on the ground. He has never waited for more research.... It seems that whenever there has been a need for quantitative expression of a forestry problem in Nova Scotia in the last 20 years Bailey has been on the job. Further, he has proceeded directly from problem definition to incisive analysis and, with time, to a solution. In the process Bailey has written many technical reports directed straight at his fellow foresters to enhance their capabilities in the field.... Mr. Bailey has established a solid reputation in the industrial and governmental segments of the profession, as well as outside it, for a careful, thoughtful, and above all factual approach to the design of forest management."

DR. MARK WALDRON, BSc (Agr) '59, director of the University School of Part-time Studies and Continuing Education, University of Guelph, has been appointed chairman of the Council of Ontario Universities committee on distance education.

FRED A. PIERCE, BSc (Agr) '60, received the Outstanding Contributions to Co-operative Education and Training Award which was presented at the annual meeting of the Association of Co-operative Educators (ACE) held in San Juan, Puerto Rico, last April. The ACE is a professional organization of Co-operative educators and trainers primarily from the United States and Canada. The Association provides training and co-ordinating services for its members so their status is enhanced within the Co-operative movement. Fred Pierce is currently employed by the Nova Scotia Department of Agriculture and Marketing in Truro, and his major responsibilities revolve around the administration of the provincial Co-operative Associations Act and Co-operative development in Nova Scotia. He has held this position since 1972 when he joined the department after 12 years with Co-operatives in Ontario and the Maritimes. Fred Pierce received the award in recognition of the publications and Co-operative topics written over the past 12 years; and, as well, recognition of his training activities and close work with Co-operative Associations in Nova Scotia.

EVANS ESTABROOKS, BSc (Agr) '64, a horticulturist with the Agriculture Canada research station in Fredericton, N.B., has been re-appointed secretary of the Agricultural Institute of Canada.

Diploma Program students enjoyed their annual trip to the Royal and met a couple of Animal Science grads on their trip: **BOB ROBSON,** BSc "65, who is Farm Manager of the Shur-Gain Research Farm in Maple, Ont., and **ELY CAVANAUGH,** BSc '68, who is Ag Rep for York County.

ANDY O. TERAUDS, BSc (Agr.) '75, has been appointed general manager of the Agricultural Institute of Canada (AIC), the national organization representing agricultural professionals and scientists across Canada. He succeeds the retiring Wes Henderson at AIC's national office in Ottawa. Raised on a farm near Cowansville, Quebec, Andy joined the AIC in 1974 as assistant general manager. During his 11 years with the AIC he has been responsible for the AIC's public relations and publications activities, He has been actively involved in the Institute's emergence as a respected national voice on issues of concern to agriculture. During his tenure *Agrologist Magazine,* the Institute's quarterly glossy, has been up-graded and refocused to better reflect the many scientific disciplines in Canadian agriculture. It also serves as a forum for opinion on important policy issues. Andy Terauds was a guiding force behind the development of Agronews, the AIC's monthly newsletter which serves as the primary means of communication between the AIC'S 5,500 members from coast to coast. Andy acted as general manager during 1982-84. He owns a farm outside of Ottawa, is an active member of the Ottawa Valley branch of the Ontario Institute of Agrologists, the Eastern Ontario Berry Growers' Association, and the North American Strawberry Growers Association. He has also been involved with numerous other groups. In accepting the appointment, Andy Terauds stated that he would continue to press for greater understanding of the many serious issues which confront Canadian agriculture.

TADEUSZ J. POPRAWSKI, BSc (Agr) '79, received his PhD degree in November 1985. Tad is now affiliated with the United States Department of Agriculture and is working at the European Parasite Laboratory located in Orgerus, France, which is near Paris.

JOHN K. KELLY, BSc (Agr Eng) '79, MSc '85, together with **DONALD**

MARSHALL, BSc (Agr Eng) '80, and **DENISE PRAIRIE,** BSc (Agr Eng) '84, have formed SRO Engineering, a consulting company in transportation, development, and agricultural engineering, with head offices in Kirkland, Quebec.

DR. FRANCINE DUFOUR, BSc (Agr) '80, has been appointed to represent Salsbury Laboratories Ltd in eastern Ontario, Quebec, and the Maritimes. Francine received her D.V.M. from the Faculty of Veterinary Medicine of the University of Montreal and completed a one-year internship in Avian Medicine at North Carolina State University.

VASILE (GLATIOTIS) KLAASEN, BSc (Agr) '80, is working in Weyburn, Sask., as a soil conservationist.

MICHAEL J. SHARKEY, MSc (Agr) '80, PhD '83, and his wife have proudly announced the birth of a daughter, Alixa, on October 13, 1985, Mike was a grad student in Entomology.

PATRICIA I. BILDER-GARRIZ, MSc (Agr) '81, is an Assistant Professor in Plant Physiology at the Faculty of Agronomy, National Comahue University, Argentina. The faculty is located in the heart of the most important fruit-growing region of Argentina, and the campus is surrounded by a 30 ha. orchard.

ANN LOUISE CARSON, BSc (Agr), '81, formerly information officer with the Townshippers Association, has been named press attaché to Quebec Agriculture Minister Michel Pagé.

CHRISTINE M. GORMAN, BSc (Agr) '81, was recently appointed District Agricultural Engineer located at the East Prince Regional Services Centre, Summerside, P.E.I. Christine received her MSc in Agricultural Engineering from the University of Saskatchewan.

GORDON OWEN, BSc (Agr Eng) '82, MSc 85, having completed a one-year term as lecturer at the Kemptville College of Agricultural Technology, is now a soil research engineer with Agricultur Canada at the Fredericton Research Station.

SYLVIO TESSIER, BSc (Agr Eng) '81, MSc (Agr Eng) '83, who is taking post-graduate training in Pullman, Washington, was twice honored by the American Society of Agricultural Engineers (ASAE) at last year's annual meeting. Of 362 papers published in ASAE publications, nine were selected to receive a 1985 Paper Award. Two of Sylvio's papers with coauthor G.S.V. Raghavan were singled out for engineering merit.

JEAN-LUC YELLE, BSc (Agr) '82, is Funk Seeds' new territory representative for Quebec.

WAYNE FAIRCHILD, MSc (Agr) '83, and his wife Sylvia are the proud parents of a second daughter, Amber Faith, born on January 4, 1985. Wayne is working toward his PhD at the University of New Brunswick.

ANDREW KEILLY, BSc (Agr) '83, of West Covehead, has been named as forage specialist with the Prince Edward Island Department of Agriculture. As forage specialist, Mr. Keily will be in direct contact with farmers dealing with forages, organizing demonstration projects, and participating in presenting extension short courses as well as working closely with District Office staff. He is located in the Research and Extension Building in Charlottetown.

GREG SALLOUM, BSc (Agr) '83, made the pages of the January 1986 issue of Rodale's *Organic Gardening* which is published in Emmaus, PA., with a note on cutworm control. "Common weeds may make an effective, safe, and inexpensive cutworm control, according to the University of British Columbia graduate student Greg Salloum. He found that cutworms would starve themselves to death before eating bait treated with extracts from pineapple weed and sagebrush, both members of the daisy family *(Compositae)."*

JOHN MWANGI, BSc (Agr Eng) '84, has left his native Kenya once again to pursue MSc studies at the National College of Agricultural Engineering in Silsoe, Bedford, England.

TAI LIN FAN, MSc (Agr Eng) '85, from Beijing, China, is working towards a PhD in Mechanical Engineering at Carleton University, Ottawa.

GERALD LAFLEUR received his PhD degree at the November 1985 Convocation and left shortly after for a two-year stint with CIDA in Burkina Faso, Africa.

deceased

DR. ROBERT NEWTON, BSA '12, on November 22, 1985, at Laguna Hills, California, in his 97th year. His wife, the late Emma Read, was also a graduate of Macdonald. His sister, Dr. Dorothy Swales, is Emeritus Curator of the McGill University Herbarium which is located at Macdonald College. Robert Newton won the Military Cross at Vimy Ridge in 1917. He received his PhD from the University of Minnesota and Honorary Doctorates from the University of Manitoba, Saskatchewan, Alberta, Minnesota, and Cambridge, England, and was made a Fellow of the Royal Society of Canada. He was Director and Founder of the Division of Biology of the National Research Council of Canada, 1928 - 1940, President of the University of Alberta, 1941-1950, and was one of the founders and governors of the Arctic Institute of North America in 1944. A man of wide interests, he accepted a position on the Board of Trustees of the National Gallery of Canada and helped to select their purchase of paintings in Europe. In 1951 he made a survey and recommended long range programs for Memorial University in Newfoundland, and in June 1985 he was honoured by having the Alberta Research Council Building named after him.

ELSIE F. (ROLLIT) SMITH, Dip educ '24, at Montreal, Que., on September 23, 1985.

MACNABB, (FALLS) JEAN, BHS '39, of Ste. Anne de Bellevue, Que., on January 5, 1986.

ERIC A. EARDLEY, BSA '30, MSc (Agr) '32, of Ottawa, Ont., on July 19, 1985.

DONALD C. ROBERTSON, BSc (Agr) '48, at Montreal, Que., on August 16, 1985.

DR. BRONYS POVILAITIS, MSc (Agr) '51, PhD '54, at Tillsonburg, Ont., on July 17, 1985.

CAROL (MESSENGER) YEAGER, BSc (HEc) '52, at Syracuse, New York, on November 9, 1985.

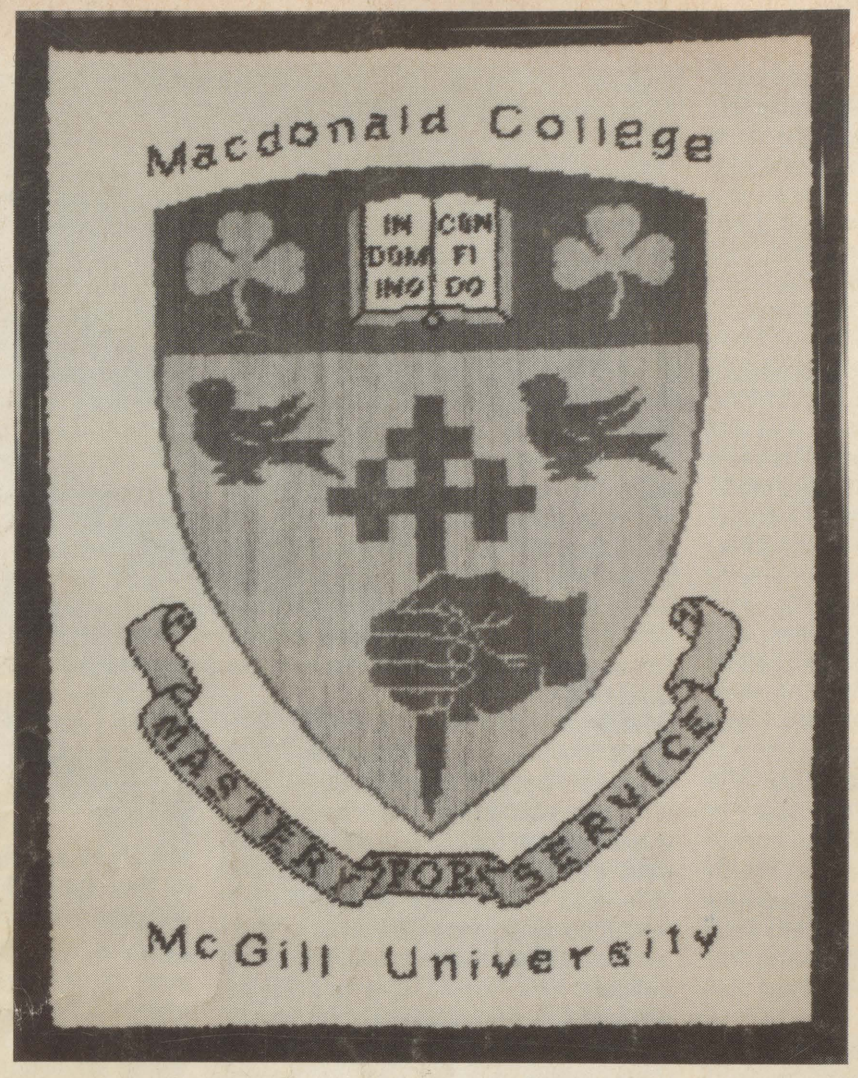
CAROL TAYLOR, BSc (HEc) '54, in Toronto, Ont., on October 12, 1985.

MONTY A. WOODLEY, BSc (Agr) '54, at Prince George, B.C. on July 29, 1985.

REV. DAVID H. ROGERS, BSc (Agr) '57, of Leask, Sask., on January 3, 1985.

GERALD A. HINES, BSc (Agr) '57, at Halifax, N.S., on December 6, 1984.

BARRY LANGILLE WALSH, BSc (Agr) '67, on October 30, 1985, at Vancouver, B.C. Barry, who graduated with First Class Honours, was a University Scholar, and received the Gray Prize in Microbiology, went on to the University of British Columbia with a Centennial Scholarship. At the time of his death he was a part owner and lab director of Wood Laboratories (1984) Ltd.



MACDONALD WALL HANGING: ORDER YOURS TODAY

Many of you may have seen the beautiful red and white woven wall hanging of the McGill University Coat of Arms. We at Macdonald College now have our own 27- by 36-inch wall hanging of our crest in the Macdonald colours of green and gold on a white background. The pile is about one half inch thick.

Is there a Macdonald graduate on your gift list? This wall hanging will make a lasting gift that will increase in value as the years go by. Ideal for someone who is already a graduate or will be soon. Buy yourself a gift! You will be proud to hang it in your home or office.

We are excited about the Macdonald wall hanging and hope that you will be, too. Please use the order form below to
ORDER YOURS TODAY.

PLEASE PRINT CLEARLY

☐ **Mr.** ☐ **Mrs.** ☐ **Miss**

NAME IN FULL _____

Address _____

City _____

Province _____ **Postal Code** _____

Price each $129.95
Please make all cheques or money orders Payable to:

MACDONALD COLLEGE

Mail Order to:
Extension Service
Box 284
Macdonald College
21,111 Lakeshore Rd.,
Ste. Anne de Bellevue, Que.
H9X 1C0

Please allow three (3) weeks for delivery